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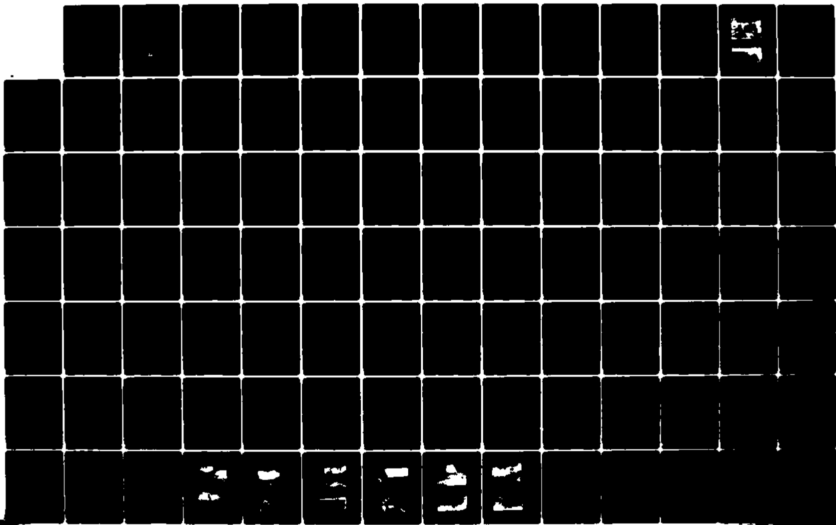

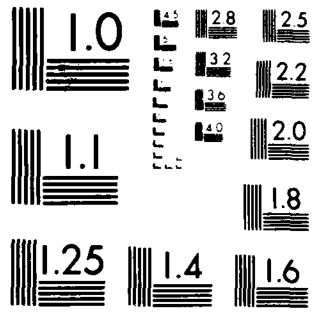

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RIPPOWAM RIVER BASIN
STAMFORD CONNECTICUT

N. STAMFORD RESERVOIR DAM

CT. 00048

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

FEBRUARY 1979

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

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Stamford Conn.
N. Stamford Reservoir Dam

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

North Stamford Reservoir Dam is a concrete masonry gravity dam 350 ft. long, with a maximum height of 40 ft. An earth fill covers the downstream slope of the dam. To the right of the concrete dam there is an earth dike embankment 437 ft. long with a maximum height of 24 ft. The spillway at the right abutment has an ungated ogee crest 280 ft. long with provision for flashboards. The dam is operated as a water supply facility for the City of Stamford.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED

JUN 21 1979

Honorable Ella T. Grasso
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor Grasso:

I am forwarding to you a copy of the North Stamford Reservoir Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, Stamford Water Company, 103 Summer Street, Stamford, Connecticut 06901.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely yours,

John P. Chandler

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

NORTH STAMFORD RESERVOIR DAM

CT 00048

RIPPOWAM RIVER BASIN
STAMFORD, CONNECTICUT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

Identification No.	CT 00048
Name of Dam:	North Stamford Reservoir Dam
Town:	Stamford
County and State:	Fairfield County, Connecticut
Stream:	Rippowam River
Date of Inspection:	25 October 1978

BRIEF ASSESSMENT

North Stamford Reservoir Dam is a concrete masonry gravity dam 350 ft. long, with a maximum height of 40 ft. An earth fill covers the downstream slope of the dam. To the right of the concrete dam there is an earth dike embankment 437 ft. long with a maximum height of 24 ft. The spillway at the right abutment has an ungated ogee crest 280 ft. long with provision for flashboards. The dam is operated as a water supply facility for the City of Stamford.

Maximum storage capacity of the reservoir to top of dike is about 2,330 acre-feet and the drainage area is 23.2 square miles. The reservoir is about 6,500 ft. long with a surface of 111 acres at spillway crest elevation. Based on both height and capacity criteria, the dam is classified as intermediate in size. Because of the threat to life and property which would result from the dam being breached, there being many homes, commercial establishments and the Merritt Parkway downstream, it has been classified as having a high hazard potential. Based on intermediate size and high hazard, the test flood is the full PMF.

There is some seepage through the rock in the spillway outlet channel. Brush and several trees are growing on the earth dike. The concrete on the spillway abutment and center walls is spalling, and there are minor seeps at construction joints in the spillway overflow weir. The concrete dam, earth dike and spillway are all judged to be in generally good condition.

The test flood inflow is 23,700 cfs. Of the test flood outflow of 23,800 cfs, 17,900 cfs would be discharged by the spillway, providing that the flashboards were not installed; 4,800 cfs would flow over the gravity dam and 1,000 cfs would flow over the dike. The gravity dam would be overtopped by 2.8 ft. and the dike by 0.8 ft. The facility could handle 38 percent of the test flood without any overtopping, with a 6,900 cfs. spillway discharge.

Within two years after receipt of this Phase I Inspection Report, the owner, the Stamford Water Company, should retain the services of a registered professional engineer to make further investigations, and should implement the results. These investigations should cover the potential overtopping of the dam and dike, and the present utilization of flashboards on the spillway crest, and the stability of the gravity dam.

The owner should also implement the following measures: (1) control growth on the earth dike and in the spillway discharge channel; (2) monitor seepage in the spillway outlet channel; (3) repair spalled concrete on the spillway abutment and center dividing walls; (4) institute procedures for a biennial periodic technical inspection; and (5) develop a formal surveillance and warning plan.

Peter B. Dyson Project Manager	Frederick Esper Vice President

COMMONWEALTH OF MASSACHUSETTS
PETER BRIAN DYSON
No. 18452
REGISTERED PROFESSIONAL ENGINEER

FREDERICK ESPER
No. 8309

This Phase I Inspection Report on North Stamford Reservoir Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

Joseph A. McElroy

JOSEPH A. MCELROY, MEMBER
Foundation & Materials Branch
Engineering Division

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

Joseph W. Finegan, Jr.

JOSEPH W. FINEGAN, JR., CHAIRMAN
Chief, Reservoir Control Center
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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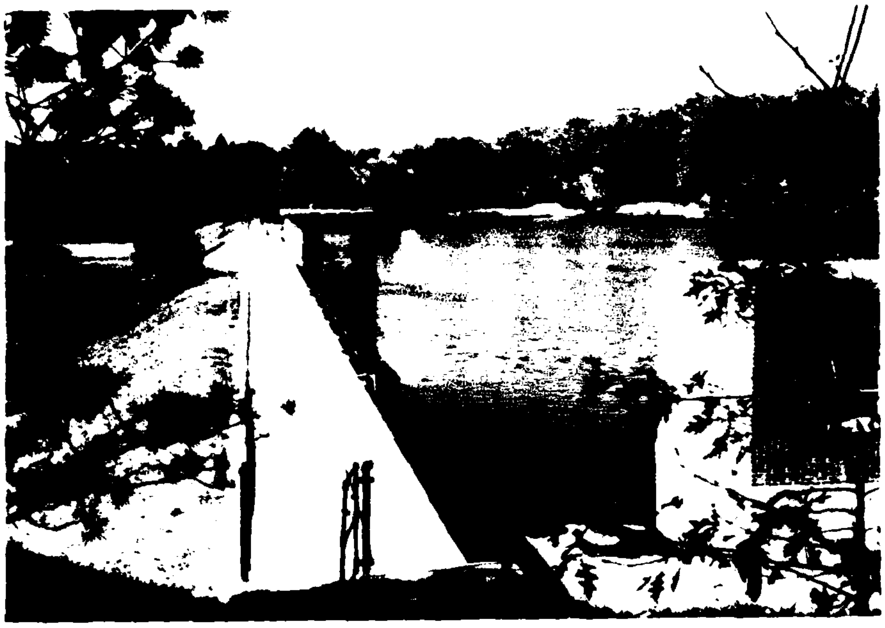
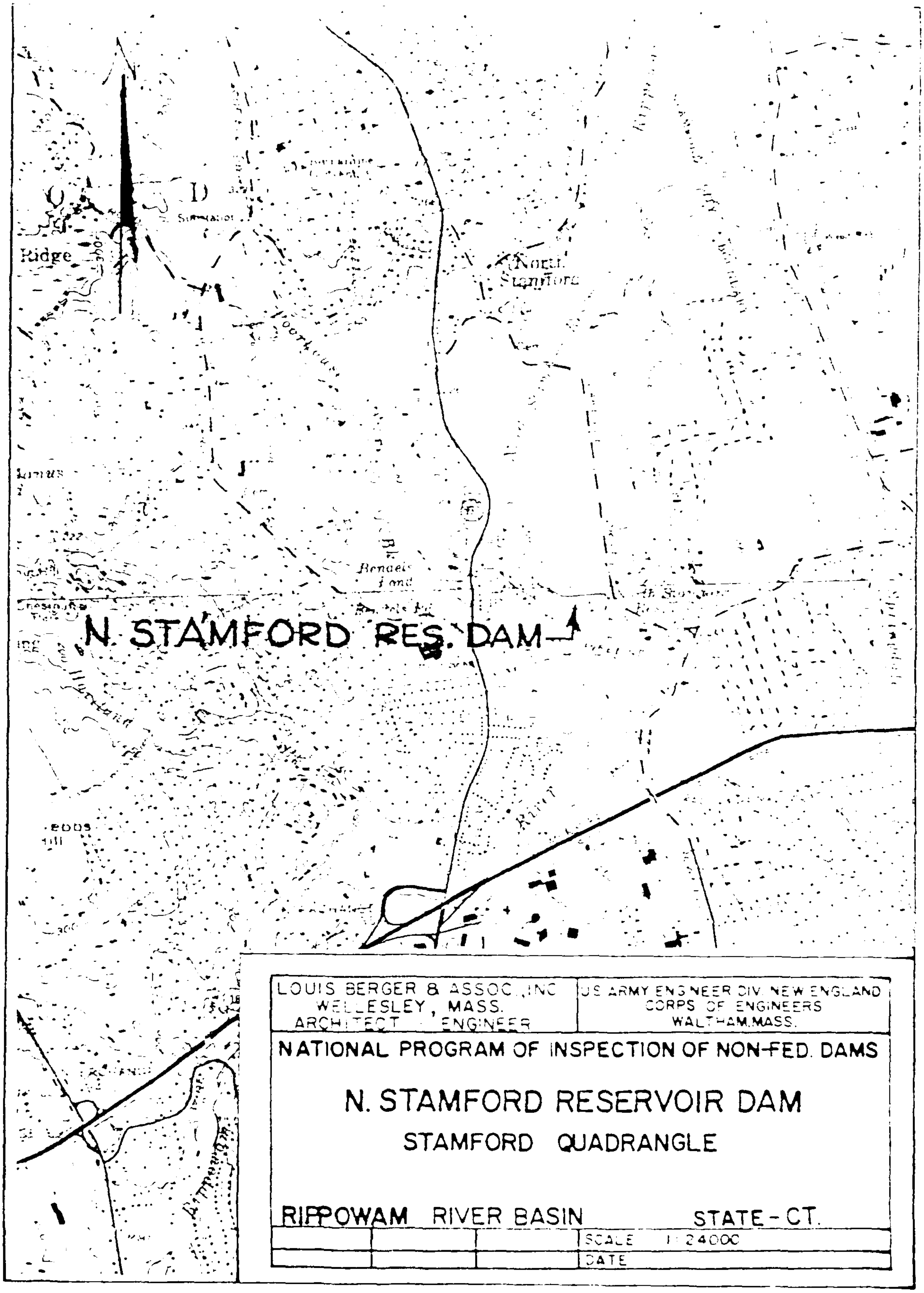
APPENDIX E - INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

NORTH STAMFORD RESERVOIR DAM



Overview from left abutment: gravity section foreground, spillways right background.

Overview from right abutment: new spillway foreground, gravity section left background.


Ridge
North Stamford
N. STAMFORD RES. DAM
River
LOUIS BERGER & ASSOC.,INC
WELLESLEY, MASS.
ARCHITECT - ENGINEER
US ARMY ENGINEER DIV. NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM,MASS.
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
N. STAMFORD RESERVOIR DAM
STAMFORD QUADRANGLE
RIPPOWAM RIVER BASIN
STATE - CT.
SCALE 1:24000
DATE

PHASE I INSPECTION REPORT

NORTH STAMFORD RESERVOIR DAM CT 00048

SECTION 1 - PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Louis Berger & Associates, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed was issued to Louis Berger & Associates, Inc. under a letter of 24 August 1978 from Ralph T. Garver, Colonel, Corps of Engineers. Contract No. DACW33-78-C-0371 has been assigned by the Corps of Engineers for this work.

b. Purpose

1. Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

2. Encourage and assist the States to initiate quickly effective dam safety programs for non-Federal dams.

3. Update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

North Stamford Dam and Reservoir are located on the Rippowam River in the City of Stamford, Fairfield County, in southwestern Connecticut. The dam site is situated about ½ mile north of the Merritt Parkway Toll Road (Route 15) and just to the east of Route 137.

b. Description of Dam and Appurtenances

1. Dam and Dike

North Stamford Dam was originally constructed in 1908 as a straight concrete masonry gravity dam, spanning the main valley of the Rippowam River, with a length of about 350 ft. The top of the gravity dam is at elevation 200.* The dam has a top width of 9 ft., an upstream batter of ½ in. per ft., and a downstream batter of 0.6 to 1. A 3 ft. deep by 5 ft. wide cutoff under the dam is indicated on the original drawings at about mid-point of the base width (Appendix B). No grouting, drainage or other foundation treatment is indicated. The height of the dam above river level is about 40 ft.

On the right abutment to the right of the main gravity section, the dam is continued as an earth dike embankment with a central concrete core wall. The dike at its junction with the gravity dam is about 14 ft. high, reducing to about a 9 ft. height some 150 ft. to the right, and then increasing to about a 24 ft. height at its extreme right, where it adjoins the spillway. The dike is curved in plan, its total length measuring about 437 ft. The dike embankment has its crest at elevation 202, 2 ft. above the top of the gravity dam. The dike embankment has a 12 ft. top width and 2 to 1 upstream and downstream slopes. The upstream slope is paved with 12 in. riprap: the downstream slope is sodded. The core wall extends from 2 ft. below the top of the dike (top of core wall El. 200) to depths of up to 26 ft., presumably to the level of firm bedrock. The concrete core wall has a 4 ft. top width, a ½ in. per ft. upstream batter and a 0.4 to 1 downstream batter. The embankment upstream from the core wall is indicated to be selected rolled embankment. That downstream from the core wall was not compacted by roller.

Along the full face of the concrete gravity section, an earth fill now covers all but about the top 10 ft. of the downstream slope of the dam. This fill extends outwards from the concrete dam as a berm about 10 ft. wide, and then on a downward slope estimated at about 2 to 1. Since this fill is not shown on the original drawings, the construction

*Project datum is about 5 ft. below MSL

was probably done at a later date, presumably because of questionable stability of the original gravity dam and as a means of increasing the sliding and overturning safety factors of the structure.

2. Spillway

The spillway, as originally constructed in 1908, is located at a saddle about 650 ft. to the right of the main river channel and immediately beyond the right end of the dike section. The 150 ft. long spillway crest is an ogee-shaped concrete gravity overflow section about 23 ft. high, with a curved downstream apron shaped to discharge releases horizontally into an unlined converging channel. The spillway channel is excavated for the most part in bedrock, and the ogee overflow is founded on bedrock. Cutoff walls 3 ft. deep were excavated in bedrock at both the upstream and downstream toes of the overflow section. The crest of the spillway ogee dam is at elevation 196.0.

As originally constructed, a dike section with core wall, similar to that for the main dike, extended from the right end of the 150 ft. long spillway to contact the elevation 202 contour about 140 ft. to the right. In 1960, in order to provide additional spillway capacity, this right closure dike was modified and converted to an ogee overflow, adding about 130 ft. of spillway length. The dike fill was removed and the concrete core wall was cut down and capped with an ogee-shaped overflow section, with its crest at elevation 196.0. At the time of this modification, pipe inserts were installed into the crests of both the old and new spillways, for the purpose of anchoring 12 in. high flashboards on top of the crest. A side channel outlet was excavated to bedrock downstream from the new ogee overflow, to direct outflows into the downstream channel of the original spillway.

3. Outlets

Outlet pipes are carried through the concrete gravity dam as supply lines to the pumping station and for releases from the reservoir. Controls for these pipes are located in an outlet gate house at the upstream face of the dam, positioned about

60 ft. left of the right end of the dam. Two 30 in. pipes are carried to the pumping plant downstream from the dam, regulated by 30 in. dia. gate valves near the bottom of the gate house well. A 36 in. dia. outlet bypass pipe leads from the reservoir to an outlet channel downstream from the dam. This is a low level reservoir outlet, with invert at about elevation 160, controlled by a 30 in. dia. gate valve in the bottom of the gate house well.

A high level intake was later added to the facility, which draws water from near the top of the reservoir through a long flume hung from the upstream face of the gravity dam. The flume leads to a 36 in. dia. intake pipe through the left abutment. This pipe feeds a micro-filter installed in a filter house high on the left abutment. A blowoff valve from the 36 in. dia. pipe leads to the small outlet canal below the dam.

c. Size Classification

North Stamford Dam is about 40 ft. high above downstream river level, impounding a storage of 1,570 acre-ft. to spillway crest level and a maximum of about 2,330 acre-ft. to the top of the earth dike. In accordance with both the height and capacity criteria given in Recommended Guidelines for Safety Inspection of Dams, the project falls into the intermediate category and therefore is classified accordingly.

d. Hazard Criteria

A breach failure of North Stamford Dam would release water down the Rippowam River, which traverses through major populated areas of Stamford. There are as many as 20 homes near river level along the river about ½ mile below the dam, a major interchange of the Merritt Parkway is located about 1 mile downstream, and there are many homes and commercial establishments along the river reach south of the Parkway. The North Stamford Reservoir Dam has therefore been classified as having a high hazard potential in accordance with the Recommended Guidelines for the Safety Inspection of Dams.

e. Ownership

North Stamford Reservoir Dam is owned by Stamford Water Company.

f. Operator

Mr. Glenn Thornhill
Chief Engineer
Stamford Water Company
103 Summer Street
Stamford, CT 06901

Telephone: (203) 324-3163

g. Purpose of Dam

The dam impounds a reservoir used as a source of municipal water supply for the City of Stamford.

h. Design and Construction History

Information obtained from the files of the State Department of Environmental Protection, Water Resources Division, and from Stamford Water Company, indicates that the dam, then known as *Mill River Reservoir Dam*, was built about 1908. The design by Albert E. Hill, Consulting Engineer, of New Haven, CT, included a concrete gravity dam 350 ft. long at the left abutment, an earth embankment with concrete core wall 437 ft. long, a concrete gravity ogee spillway 150 ft. long, and an earth embankment section with concrete core wall 140 ft. long at the right abutment. The top of the concrete dam was 4 ft. above the spillway crest and the top of the embankment sections were 6 ft. above it.

During the storm of October 15-17, 1955, the outflow exceeded the spillway capacity and the concrete dam was overtopped by 2½ in. Subsequent studies by Clarence Blair Associates, Inc., Civil Engineers, of New Haven, CT, resulted in a recommendation to extend the spillway an additional 126 ft. towards the right abutment. Construction was carried out in 1961; the State's Certificate of Approval dated October 2, 1961, notes that, due to the omission of two 2 ft. piers, the effective length of the spillway addition is 130 ft., giving a total spillway crest length of 280 ft. 12 in. high flashboards were also installed on the crest of the spillway at that time.

i. Normal Operational Procedure

There are no formal operational procedures. According to the Chief Engineer, the reservoir is normally kept as full as possible. The 12 in. high flashboards are installed in May and removed in October each year. If a storm is anticipated, the reservoir is drawn down as much as 4 ft. below normal (to elevation 192). The 30 in. dia. blowoff gate is used for this evacuation.

1.3 Pertinent Data

a. Drainage Area

The drainage area above the North Stamford Reservoir is about 23.2 square miles, being about 11 miles long and an average of about 2 miles wide. The area has a maximum width of about 4 miles at its mid-length. Above North Stamford Reservoir Dam and below Laurel Reservoir Dam, located about 2.8 miles upstream, the sub-drainage area on the Rippowam River is about 9 square miles; above Laurel Dam and below Mill River and Trinity Dams, which are about 3.6 miles farther upstream, the sub-drainage area on the Mill River is about 9.5 square miles; above Trinity Dam, the sub-drainage area is 0.62 square miles; above Mill River Dam on the Mill River the sub-drainage area is 4.07 square miles. A sketch of the area showing the location of reservoirs and streams is illustrated on Sheet D-1, Appendix D.

The topography of the drainage areas are generally wooded, rolling terrain with occasional small pondages and swampy areas along the stream courses. The rim of the basin rises from between 150 to 200 ft. above the stream valley. The longest water course upstream from North Stamford Dam measures about 13.3 miles, with an average slope of about 40 ft. per mile.

No major developments are contained within the drainage area, but the terrain is moderately dotted with homes and small communities.

b. *Discharge at Damsite*

1. Outlet Works Conduit

The 36 in. dia. low-level outlet pipe has its invert at about elevation 160, providing a head of about 36 ft. with reservoir at spillway crest level. The discharge at this head is estimated to be about 195 cfs. At this discharge, reservoir evacuation would be at the rate of about 16 acre-ft. per hour. At spillway crest level, it would require about 6.5 hours to lower the level of the reservoir 1 ft., not considering inflow in the interim. As indicated on Sheet D-2, to evacuate the reservoir to Elevation 165, considering no inflow in the interim, would entail a period of about 4.9 days. With an average inflow of about 10 cfs. into the reservoir during the interim, a period of about 5.2 days would be needed for this evacuation. Evacuation of the reservoir in case of a flood would therefore be practically impossible.

An outlet discharge curve is shown on Sheet D-2, Appendix D.

2. Maximum Known Flood at Damsite

During the storm of October 15-17, 1955, the runoff exceeded the spillway capacity, and water 2½ in. deep flowed over the top of the main dam. The flashboards were not installed on the spillway. The estimated discharge over the dam and spillway was 4,400 cfs. Neither the inflow into North Stamford Reservoir nor the state of outflows at the upstream reservoirs were determined.

3. Spillway Capacities

A spillway discharge curve has been prepared for the spillways as they presently exist. A discharge curve for outflows through the spillways and over the dam and dike are shown on Figure 1, Sheet D-3, Appendix D. Computations are shown on Sheet D-4. Pertinent discharges are as follows:

a. Spillway capacity at top of concrete dam El. 200 -	7,350 cfs
b. Spillway capacity at top of earth dike El. 202 -	14,600 cfs
c. Spillway capacity at test flood surcharge El. 202.7 -	17,500 cfs
d. Total Project Discharge at Test Flood Surcharge El. 202.7 -	23,000 cfs

4. Flashboarded Spillway Capacity

With the intent of increasing the reservoir yield by capturing and storing runoffs above spillway crest level, 12 in. high flashboards are installed on the spillway crest each spring and removed in the fall. The flashboards are held in place by pipe standards inserted in holes in the crest.

With the flashboards in place, the capacity of the spillway is accordingly reduced. A discharge curve for the spillway with 12 in. flashboards installed is shown on Figure 1, Sheet D-3. It will be noted that, with the reservoir level at the top of the gravity dam, elevation 200, the spillway discharge will be about 4,800 cfs, or 65 percent of that for the unobstructed crest. With the reservoir at the top of the earth dike, elevation 202, the spillway discharge will be about 10,400 cfs. or 70 percent of that of an unobstructed crest.

c. Elevations (Ft. above project datum, which is 3.84 ft. above MSL datum)

1. Streambed at centerline of dam - 160
2. Maximum tailwater - Not computed
3. Upstream invert of low-level outlet pipe - 160
4. Recreation pool - Not applicable
5. Full flood control pool - Not applicable
6. Ungated spillway crest - 196
7. Top of spillway flashboards - 197
8. Top of concrete gravity dam - 200
9. Top of earth dike - 202
10. Top of dike core wall - 200
11. Test flood design surcharge - 202.7

d. Reservoir

1. Length of maximum pool - 6,600 ft.
2. Length of recreation pool - Not applicable
3. Length of flood control pool - Not applicable

e. Storage (acre-ft.)

1. Recreation pool - Not applicable
2. Flood control pool - Not applicable
3. Spillway crest pool El. 196 - 1,571
4. Top of concrete dam El. 200 - 2,060
5. Test flood pool El. 202.7 - 2,436

f. Reservoir Surface (acres)

1. Recreation pool - Not applicable
2. Flood control pool - Not applicable
3. Spillway crest El. 196 - 111
4. Top of concrete dam El. 200 - 132
5. Test flood pool El. 202.7 - 147

g. Dam

1. Type - Concrete masonry gravity
2. Length - 350 ft.
3. Height - 40 ft.
4. Top width - 9 ft.
5. Side slopes - Upstream batter 1 in. per ft.
   Downstream batter 0.6 in. per ft.
6. Zoning - Not applicable
7. Impervious core - Not applicable
8. Cutoff - 3 ft. deep by 5 ft. wide at center of base
9. Grout curtain - None
10. Other - Dam presumed to be founded on sound rock

Dike

1. Type - Earth embankment with concrete core wall
2. Length - 437 ft.
3. Height - 14 ft. at gravity dam abutment; 9 ft. at center length; 24 ft. at spillway abutment
4. Top width - 12 ft.
5. Side slopes - 2 horizontal to 1 vertical upstream and downstream
6. Zoning - Compacted fill upstream from center core wall; uncompacted fill downstream from center core wall
7. Impervious core - Concrete core wall at center of dike, extending from 2 ft. below top of dike to bedrock
8. Cutoff - Center core wall
9. Grout curtain - None
10. Other - Nil

h. Diversion and Regulating Tunnel - None

i. Spillway

1. Type - Concrete ogee overflow crest
2. Length of weir - 280 ft.
3. Crest elevation - 196
4. Gates - None, but provision for 12 in. flashboards
5. Upstream channel - Natural saddle with low point at approx. elevation 180. Diversion channel during original construction was excavated through saddle approx. 30 ft. wide to elevation 175. Approach to extended crest, where it was higher, was excavated to elevation 194.
6. Downstream channel - Converging channel below original spillway excavated to rock at approx. elevation 175. Downstream from extended crest, a side channel directs flows into the original spillway channel.
7. General - Nil

j. Regulating Outlets

1. Invert - El. 160
2. Size - 36 in. dia.
3. Description - Cast Iron pipe through dam
4. Control Mechanism - 24 in. dia. gate valve in line in wet well at gatehouse, with control hoist
5. Other - Nil

SECTION 2 - ENGINEERING DATA

2.1 Design

The dam was designed by Albert E. Hill, Consulting Engineer, New Haven, CT, in 1908. It was then known as Mill River Reservoir. Copies of the General Plan, Sections and Gatehouse drawings are included in Appendix B.

The fill at the downstream face of the gravity dam is not shown on the original drawings. It was presumably added later, on the basis that the structural stability of the dam was in question, and for the purpose of adding a safety factor against sliding and overturning. No documentation of design considerations toward this end have been retrieved.

The spillway proved inadequate to pass the outflow from the October 15-17, 1955, storm and the dam was overtopped by 2½ in. A 130 ft. long spillway extension was designed by Clarence Blair Associates, Inc., Civil Engineers, New Haven, CT, in 1960. This firm also designed the 12 in. high flashboard installation at that time. Copies of the General Plan, Details, "As Built" and Flashboards drawings are included in Appendix B.

2.2 Construction

North Stamford Reservoir Dam is said to have been constructed in 1908-09, but it is not known by whom. No records have been found showing when the fill modification was added to the downstream face of the gravity dam. The 130 ft. extension of the spillway to the west of the original 150 ft. spillway was constructed in 1960-61.

2.3 Operation

The facility is operated as a water storage and supply reservoir by Stamford Water Company. There are no formal operating procedures.

2.4 Evaluation

a. Availability

The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

b. Adequacy

The lack of in-depth data, such as engineering properties of the foundation and embankment materials, precludes any definitive review and assessment of the adequacy of this dam.

c. Validity

The validity of the engineering data acquired covering the dam and spillway structures is considered acceptable and is not challenged.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General

The visual inspection of North Stamford Reservoir Dam took place on 25 October 1978. At that time, the reservoir was about 1 ft. below spillway crest level.

The drawings show that the gravity dam, dike core wall and spillway crest are all carried down to bedrock foundation. This bedrock is not in evidence except at the spillway channel where it is well exposed on the right abutment. It is a granitoid gneiss, essentially massive and unweathered. There is a well developed high angle joint system in the rock at the spillway, striking more or less perpendicular to the spillway centerline. Minor seeps were noted from some of the vertical joints near the spillway crest.

b. Concrete Gravity Dam

The main concrete gravity dam has a 30 ft. high fill against its downstream face and only about 10 ft. of the dam was visible. The original concrete masonry facing and the downstream coping at the top of the dam have been resurfaced with gunite, and the original condition of the concrete before resurfacing could not be determined. From all appearances, that portion of the dam which was visible is in satisfactory condition.

The earth fill on the downstream face of the dam appeared in excellent condition, with no evidence of slope movement, boils, drainage or seepage (Appendix C, Photo Nos. 1 & 2). As noted in Section 1.2b, it is speculated that this fill was added to shore up the dam against sliding and overturning forces. Although the surface of the fill is sodded and appears quite stable, it is not believed that it would remain stable in the event of an overtopping of the dam, and that it would be easily eroded and washed away by any appreciable volume of overtopping flow. Information was not available whether damage was sustained to this fill during the 1955 flood, when the dam was overtopped by 2½ in.

The intake flume, which leads to the high level outlet pipe to the microfilter house on the left abutment, is hung along the upstream face of the concrete dam by steel straps connected to the crest of the dam.

c. Dike Section

The earth dike on the right abutment appears to be in good condition. The upstream slope is covered with rock riprap generally not exceeding 12 in. in size. The riprap slope appears stable and in good condition. Several trees are growing on the upstream slope, two of which are about 12 in. in diameter (Appendix C, Photo Nos. 3 & 4). A light brush growth covers the downstream slope and grass is well established on both the crest and downstream slope. The downstream slope appears stable and shows no evidence of seepage or boils. Since this dike is at a higher level on the abutment than the main river channel to the left and the spillway channel to the right, it would not be expected that seeps would exit along its toe.

d. Spillways

The concrete in the ogee overflow sections of the spillway is in generally fair to good condition, with some cracking and spalling evident in the old spillway section and with small seeps and efflorescence issuing from some of the joints (Appendix C, Photo Nos. 5, 6, 7 & 8). Spalling has occurred at the top and along the base of the guide wall which was the original right training wall of the old spillway (Appendix C, Photo No. 8). Some minor seepage was noted below the concrete ogee of the new spillway section, emanating from the nearly vertical joints in the bedrock. Some slight seepage appeared below the old ogee section (Appendix C, Photo No. 9). The collective seepage was in evidence at the lower end of the spillway outlet channel near the bridge about 200 ft. downstream, and was estimated to be between 40 and 60 gpm.

The outlet channel downstream from the spillway is either excavated or scoured to exposed bedrock (Appendix C, Photo Nos. 11 & 12). The side channel below the new spillway crest is excavated to bedrock and low concrete walls protect the slope on the lower side where top of bedrock was at a low level. The bridge downstream from the spillway outlet channel

has about a 40 ft. wide by 14 ft. high arched waterway and may form a constriction at lower flows and be overtopped for higher flows, to produce some backwater effect; however, it does not appear that such backwater would affect flow over the spillway crest, even for a major flood event.

Although no flashboards were on the spillway crest at the time of the inspection, insert holes were visible along the crest, spaced at about 6 ft. centers. A cable was strung across the crest between walls, presumably as a safety precaution for workers when the flashboards are installed or removed. No operating bridge deck spans the spillway crest, and there is no means of access to the boards except along the crest. It is not known whether the flashboards can be removed when water is against or overtopping them. It is believed that, in the event the boards are being overtopped, there would be no practical means of effecting their removal until the reservoir receded below spillway crest level.

The use of flashboards on the spillway crest will considerably reduce the ability of the project to handle larger magnitude floods, as is noted in Section 1.3b. Once installed, it does not appear that they could be quickly removed in anticipation of a severe storm. Sudden removal while the reservoir level was near their top could result in a larger flood wave downstream than would be the case for gradually increasing spills over the ungated crest.

e. Reservoir Area

The shoreline upstream from the dam appears to be stable on both left and right abutments. The shoreline along the left reservoir bank for a distance of approximately 500 ft. has hand-placed stone protection. The right shoreline appears to be quite stable with good tree growth and no evidence of slides or movements.

No homes are built close to shoreline at this reservoir and there are no constraints on reservoir rise within the surcharge storage space. Lakeside Drive traverses along the left side of the lower portion and crosses over at about mid-length of the reservoir. The reservoir waterway under this crossing was not examined to determine whether it would constrict flow through the pond at high inflows. It is not known whether this roadway crossing would be inundated by high reservoir levels.

f. Downstream Channel

The waterway under the bridge 200 ft. downstream from the spillway has an opening of about 400 sq. ft., with its bottom at about elevation 165 to 170. Approximate computations show that spillway discharges in excess of about 7,500 cfs will be constricted and the bridge will be overtopped. It is not expected that backwater because of the constriction will be of such height as to drown out the spillway crest.

If the bridge is overtopped, several adjacent homes will be threatened. About ½ mile downstream there is a housing development of up to 20 homes which appear to be within the flood plain for high outflows from the reservoir. The Merritt Parkway and a major interchange are close to river level about 1 mile below the dam. The Rippowam River crosses under the Merritt Parkway and traverses through the City of Stamford downstream.

The river from the dam to the vicinity of the Merritt Parkway is confined and little valley storage will be available at river stages up to a 15 ft. depth. The river valley beyond the highway opens up somewhat, but valley storage does not appear to be large. It is believed that a flood wave owing to a major breach at North Stamford Dam would persist, with but little diminishing discharge, until tidewater level is reached.

3.2 Evaluation

The visual inspection of the dam and its appurtenant structures revealed sufficient information to permit an assessment to be made of those features affecting the safety and stability of the structure. The North Stamford Reservoir Dam and appurtenant works are judged to be in good condition.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 Procedures

The North Stamford Reservoir Dam is operated by personnel of the Stamford Water Company, who are stationed at the filter plant immediately below the dam. Reservoir operation entails mainly the release of stored water from the reservoir as water supply needs warrant. 12 in. high flashboards are fixed to the spillway in May and removed in October each year. The reservoir is normally maintained as full as possible, but is said to be drawn down as much as 4 ft. below normal storage level in anticipation of a storm, by using the 30 in. dia. blowoff gate. No documented operating procedures have been prepared.

4.2 Maintenance of Dam

Periodic maintenance of both the concrete structures and the embankment section of the dam is carried out by the Water Company. No documented maintenance instructions have been prepared.

4.3 Maintenance of Operating Facilities

All gate valves are said to be serviceable and inspected regularly. No specific maintenance program is in effect.

4.4 Warning System

No warning system is in effect at this dam.

4.5 Evaluation

The North Stamford Reservoir Dam has simple operating devices and therefore requires no detailed operating procedures. It is recommended, however, that these procedures should be formalized and put into writing. Maintenance involves periodic growth removal from the dam, repair of damaged concrete structures, and surveillance regarding seeps, slope damage, animal burrows, etc. A formal warning and emergency evacuation system should be developed.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. General

The drainage area above North Stamford Reservoir is about 23.2 square miles. As noted in Section 1.3a, the Mill River tributary of the Rippowam River upstream from North Stamford Reservoir has several major dams and reservoir storages along its course, which will considerably affect the runoff characteristics of the basin. It was decided that the configurations, slopes and runoff influences are sufficiently different for the various sub-areas of the tributaries above North Stamford and Laurel Reservoir to warrant a more detailed hydrologic analysis on the basis of each impoundment and associated sub-basin area.

The general topographic characteristic of the basin is best described as rolling terrain, for which the March 1978 Preliminary Guidance Report from the NED gives a suggested CMS value for a 23 square mile drainage area of about 1,400 CSM. On this basis the inflow into North Stamford Reservoir would approximate 32,500 cfs. The more detailed analysis discussed below was undertaken to verify this approximation or to ascertain an inflow value based on the more specific basin criteria.

The project is basically a low surcharge storage - high spillage project. Part of the dam is a concrete gravity structure and part is an earth embankment with concrete core wall.

b. Design Data

No design data was recovered for this dam.

c. Experience Data

As noted in Section 1.3b, the estimated reservoir outflow through the spillway and over the concrete gravity dam during the October 1955 storm was estimated at 4,400 cfs. No estimate of the reservoir inflow was recorded.

d. Visual Observations

No evidences which would indicate possible high flows through the reservoir or in the downstream channel have been noted or recorded.

e. Test Flood Analysis

1. Drainage Areas

The 23.2 square mile basin drainage area above North Stamford Reservoir was divided into four sub-areas for the hydrologic and hydraulic analysis. A flood hydrograph was prepared for each sub-area and flood routings were conducted where flows passed through the reservoirs sited on the streams. These sub-areas, noting locations, drainage area size, water course length and river slope, and the sizes of the impoundments are delineated and tabulated on Sheet D-1 in Appendix D.

2. Reservoir Areas and Capacities

At normal storage level, North Stamford Reservoir impounds about 1,570 acre-ft. For determining reservoir surcharge capacity, planimetered areas were taken from contours delineated on the USGS 2,000 ft. per in. quadrangle sheets. Area capacity curves for North Stamford Reservoir are shown on Figure 2, Sheet D-5, Appendix D. Computations for area-capacities are shown on Sheet D-6.

For determining surcharge storages at the upstream reservoirs for use in flood routings, areas were similarly planimetered and storages computed. Laurel Reservoir areas and capacities are shown on Sheets D-6 and D-7; Trinity Reservoir and Mill River areas and capacities are shown on Sheets D-6 and D-8.

3. Outflow Discharge Capacities

For use in the flood routings of the inflows through the various impoundments, discharges were computed through the spillways and over the tops of the dams on the several reservoirs upstream. These are shown for Trinity Dam on Sheet D-4; and for Laurel and Mill River Dams on Sheet D-9. Spillway and dam overtopping capacities for North Stamford Dam are shown on Figure 1, Sheets D-3 and D-4.

4. Test Flood

North Stamford Reservoir Dam is about 40 ft. high and impounds about 2,300 acre-ft. to top of dam. As noted in Section 1.2c, it is therefore categorized in the intermediate classification. As noted in Section 1.2d, the hazard potential is classified as high. The Recommended Guidelines for Safety Inspection of Dams requires that for hydraulic evaluation the dam adequacy be tested for a full PMF.

5. Precipitation Data

Precipitation data was obtained from Hydrometeorological Report No. 33, which for the southwestern Connecticut area approximates 24.5 in. of 6 hour point rainfall over a 10 square mile area. This value was reduced by 9 percent to apply to a 23.2 square mile total area, and by an additional 19 percent to conform to the area fit reduction criteria. The 6 hour rainfall was distributed into ½ hour incremental periods as suggested in COE Publication EC1110-2-1411. Infiltration losses of 1 in. during the first hour and 0.2 in. during each succeeding hour were assumed. The net rainfall excesses for developing the runoff hydrographs are shown on Sheet D-10, Appendix D.

6. Drainage Basin Criteria

In order to evaluate the sub-drainage basin characteristics for lag and transport times needed to develop the sub-basin hydrographs and upstream reservoir outflow patterns, a river profile of the streams and reservoirs was prepared from the USGS quadrangle sheets. This profile is shown on Fig. 3, Sheet D-11. The incremental stream lengths for each sub-drainage basin were evaluated for time of concentration, lag time, and resulting flow velocity. The resulting values are recorded on Sheet D-12, Appendix D. Time-of-concentration and lag times were selected so as to produce a weighted average equivalent flow velocity within the various sub-basin streams of about 0.75 ft. per second, and a reservoir outflow transport velocity between reservoirs of about 1.5 ft. per second.

7. Selected Unitgraph

The unitgraph used for developing the various sub-basin inflow hydrographs is the curvilinear adaptation of a triangular unitgraph, shaped as described in Design of Small Dams. These unitgraphs for the variously adopted time-to-peak values selected for the differing sub-basins are shown on sheets D-13 and D-14.

8. Runoff Hydrographs and Flood Routings

Runoff hydrographs were prepared for each of the sub-areas selected. After the appropriate routings through Trinity, Mill River and Laurel Reservoirs, the runoff hydrographs were combined to form the inflow hydrograph into North Stamford Reservoir. This inflow hydrograph was then routed through North Stamford Reservoir to ascertain reservoir outflows and surcharge storage encroachments.

Printout sheets of the HEC-1 computer solution for PMF, 0.5 PMF and 0.35 PMF flood events are included in Appendix D.

The results of these routings are summarized below:

Flood Magnitude	Maximum Surcharge Elevation cfs	Maximum Outflow from Reservoir cfs	Maximum Spillway Outflow * cfs	Maximum Outflow over Gravity Dam cfs	Maximum Outflow over Dike cfs
Full PMF	202.80	23,800	17,900	4,800	1,000
0.5 PMF	200.85	11,000	10,200	800	0
0.35 PMF	199.80	6,900	6,900	0	0

For the full PMF, with a 2.8 ft. overtopping of the gravity dam (Elevation 200), approximately 2,500 acre-ft. of the runoff would spill over the gravity dam, during a 13-hour period. For the 0.5 PMF, the 0.85 ft. overtopping would discharge about 360 acre-ft. during a 5-hour period.

*Assuming flashboards not installed.

On Fig. 4, Sheet D-15, the relationship of total outflow discharge to the percentage of the PMF inflow is plotted. It is indicated that a 0.38 PMF event could be accommodated before the gravity dam would be overtopped.

In the event that the gravity dam and earth dike were raised to about elevation 204, all inflows for floods up to the PMF could be handled through the spillway, with no threat of damage to the facilities below the dam or to an overtopping of the dam or dike.

f. Dam Failure Analysis

1. Breach Failure of Gravity Dam

Since an overtopping of the gravity dam could wash away the fill at the toe of the dam, its resistance against sliding and overturning could be reduced and a failure of a portion of this dam could conceivably occur. With the water at the top of the dam, a breach outflow as suggested in the NED March 1978 Guidance Report, with an assumed failure width of about 100 ft., would produce a flood wave of about 42,500 cfs. (See computations on Sheet D-16). The spillway discharge of 6,900 cfs. added to the breach outflow would give a discharge downstream of about 49,400 cfs. The stage-discharge for the river reach immediately before the breach shows that a depth of less than 10 ft. would prevail down river above the Merritt Parkway crossing. After the breach, the stage-discharge for a flow of about 50,000 cfs. shows that this depth would increase to more than 25 ft. At this depth, the valley storage will capture about 1,000 acre-ft. of the outflow, somewhat diminishing the flood wave downstream. However, more than 20 homes and several commercial establishments are well within the flood plain for such a discharge. Delineated on Figure 4, Sheet D-17 (Quad sheet graphic), is the approximate area which could be flooded by a breach failure of the concrete dam.

SECTION 6 - STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

The field investigations of the earth embankment revealed no significant displacements or distress which would warrant the preparation of slope stability computations based on assumed soil properties and engineering factors. Data on the engineering characteristics of the embankment material is lacking. Depth of cutoff wall is not known.

The placing of an earthfill at the toe of a concrete gravity dam is unusual. This points to the premise that, at some later time after the dam was constructed, the fill was added because of concern about stability of the dam. No engineering data has been recovered in this regard, however, and it is not known with certainty what prompted the addition.

The downstream fill reduces sliding and overturning forces on the concrete dam and ensures a higher factor of safety for the structure. A flow of any magnitude over the dam would in all probability wash out most of the earthfill at the toe, and thereby threaten the stability or bring about the failure of the structure.

Specific items noted during the investigation which should be corrected and/or continually observed are listed in Section 7.3.

b. Design and Construction Data

No plans or calculations of value to a stability assessment are available for this dam.

c. Operating Records

There are no formal operating records for this dam.

d. Post Construction Changes

The results of the field inspection and a check of the available records produced no evidence of changes which might adversely influence stability of the embankment. Lengthening of the spillway in 1961 increased the hydraulic capacity.

e. Seismic Stability

The dam is located in Seismic Zone No. 1 and, in accordance with recommended Phase I guidelines, does not warrant seismic analyses.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition

On the basis of the Phase I visual examination, the North Stamford Reservoir Dam appears to be in good condition and functioning adequately. The deficiencies indicate that some additional routine maintenance is desirable.

b. Adequacy of Information

The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

c. Urgency

The recommendations enumerated below should be implemented by the owner within two years after receipt of the Phase I Inspection Report. The remedial measures should be implemented within one year.

d. Need for Additional Investigation

The visual inspection identified a number of potential problems. Additional investigations are required as recommended in Para. 7.2.

7.2 Recommendations

It is recommended that the owner should retain the services of a competent registered professional engineer to make investigations and studies of the following items, and, if proved necessary, design appropriate remedial works:

1. Determine whether the dam and dike should be raised to prevent overtopping during severe floods.

2. Review the use of flashboards on the spillway crest and determine the feasibility of either abandoning their use altogether, or of substituting gates which could be operated in anticipation of, or for management of, flood inflows.

3. Investigate the stability of the gravity dam.

7.3 Remedial Measures

a. Operation and Maintenance Procedures

1. Brush growth on the earth dike should be removed and controlled on a regular basis.

2. A program for gradual removal of trees from the earth dike should be adopted.

3. Brush growth in the riprapped slope in the right side of the spillway discharge channel should be cleaned out.

4. Seepage quantity and clarity in the spillway outlet channel should be monitored periodically during periods of high reservoir level (but without any discharge over the spillways), and at least once a year. The downstream toe of the embankment should be checked for seepage biannually.

5. Spalled concrete on the downstream spillway abutment and center dividing walls should be repaired to prevent further deterioration.

6. Procedures for a biennial periodic technical inspection of the dam, dike and appurtenant works should be instituted.

7. A formal surveillance, flood warning and emergency evacuation plan should be developed.

7.4 Alternatives

The only practical alternative to those discussed in Para. 7.2 is to increase spillway capacity, either by lengthening the sill at the present elevation, or by providing movable gates.

APPENDIX A

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION
PHASE I

Identification No. CT 00048 Name of Dam: North Stamford Reservoir Dam

Date of Inspection: 25 October 1978

Weather: Clear Temperature: $60^{\circ}F$

Pool Elevation at Time of Inspection: 195

Tailwater Elevation at Time of Inspection: Not applicable

INSPECTION PERSONNEL

Pasquale E. Corsetti	Louis Berger & Assoc., Inc.	Acting Project Manager
Carl J. Hoffman	Louis Berger & Assoc., Inc.	Hydraulics, Structures
Andrew F. Pniakowski	Louis Berger & Assoc., Inc.	Structures
Thomas C. Chapter	Louis Berger & Assoc., Inc.	Hydrology, Soils
William S. Zoino	Goldberg Zoino Dunnicliff & Assoc., Inc.	Soils

OWNER'S REPRESENTATIVE

Glenn Thornhill	Stamford Water Company	Chief Engineer

VISUAL INSPECTION CHECKLIST

Identification No. CT 00048 Name of Dam: North Stamford Reservoir Dam Sheet 1

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
EMBANKMENT Vertical alignment and movement	Alignment good, no movement evident.
Horizontal alignment and movement	Alignment good, no movement evident.
Unusual movement or cracking at or near the toe	None evident.
Surface cracks	None evident.
Animal burrows and tree growth	No burrows. About 8 trees on upstream slope, 2 or 3 about 12 in. dia. Light brush on downstream slope and crest.
Sloughing or erosion of slopes	None evident.
Riprap slope protection	Max. 12 in. rock in fair condition. Minor local displacement by tree growth and roots penetrating u/s slope.

VISUAL INSPECTION CHECKLIST

Identification No. CT 00048 — Name of Dam: North Stamford Reservoir Dam — Sheet 2

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
Seepage	None observed at embankment. 50-60 gpm observed at spillway outlet channel.
Piping or boils	None observed. Seepage through bedrock noted downstream of spillway.
Junction of embankment and abutment, spillway and dam	Good condition, no erosion.
Foundation drainage	None.
<u>OUTLET WORKS</u> Approach channel	None.
Outlet conduit concrete surfaces	N/A
Intake structure	Flume hung from upstream face of concrete dam at about half depth. Original low level inlet disused but serviceable.

VISUAL INSPECTION CHECKLIST

Identification No. CT 00048 Name of Dam: North Stamford Reservoir Dam Sheet 3

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
Outlet structure	36 in. dia. blowoff from original gate structure.
Outlet channel	Stone masonry lined channel.
Drawdown facilities	36 in. dia. blowoff.
<u>SPILLWAY STRUCTURES</u> Concrete weir	Old weir has some efflorescence at several construction joints. New weir has vertical construction joints at 40 ft. spacing with 3-4 cracks per section, a horizontal joint, two hairline cracks with small seepage.
Approach channel	None.
Discharge channel	Bedrock below spillways (sound granitoid gneiss). Left training wall shows spalling. Center wall shows spalling and efflorescence. Masonry arch road bridge over channel 400 ft. d/s, below which channel boulder strewn.

VISUAL INSPECTION CHECKLIST

Identification No. CT 00048 Name of Dam: North Stamford Reservoir Dam Sheet 4

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
Stilling basin	None.
Bridge and piers	None.
Control gates and operating machinery	12 in. high flashboards installed between May and October.
INSTRUMENTATION Headwater and tailwater gages	None.
Embankment instrumentation	None.
Other instrumentation	None.
RESERVOIR Shoreline	Right shoreline heavily wooded, gentle slopes, no evidence of slides or sloughing. Left shoreline has riprap for 500 ft., also appears stable.

VISUAL INSPECTION CHECKLIST

Identification No. CT 00048 | Name of Dam: North Stamford Reservoir Dam | Sheet 5

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
Sedimentation	None evident.
Upstream hazard areas in event of backflooding	None.
Alterations to watershed affecting runoff	None evident.
DOWNSTREAM CHANNEL	
Constraints on operation of dam	Spillway discharge channel reduces from about 280 ft. at crest to pass under masonry arch bridge 400 ft. d/s with 40 ft. span and 14 ft. rise.
Valley section	Natural, boulder strewn.
Slopes	Gentle.
Approx. No. of homes/population	About 20 homes between dam and Merritt Parkway. City of Stamford south of Parkway.

VISUAL INSPECTION CHECKLIST

Identification No. CT 00048 Name of Dam: North Stamford Reservoir Dam Sheet 6

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
OPERATION & MAINTENANCE FEATURES Reservoir regulation plan, normal conditions	No formal plan. Water released as required.
Reservoir regulation plan, emergency conditions	No formal plan. Water level lowered up to 4 ft. below normal through 36 in. dia. blowoff.
Maintenance features	Brush cut, grass mowed periodically. Concrete surfaces repaired as needed (1962 last time).
CONCRETE DAM Seepage or leakage	None evident.
Structure to abutment/embankment junctions	Left abutment appears tied to bedrock. Right embankment appears good.
Drains	None.
Water passages	N/A

VISUAL INSPECTION CHECKLIST

Identification No. CT 00048 Name of Dam: North Stamford Reservoir Dam Sheet 7

VISUAL EXAMINATION OF	OBSERVATIONS AND REMARKS
Foundation	Apparently on bedrock. Foundation treatment unknown. Earth fill covers d/s face.
Surface cracks, concrete surfaces	Visible surfaces repaired with gunite in 1962 and 1977. Minor cracking evident, no seepage observed.
Structural cracking	Nothing of consequence evident.
Vertical and horizontal alignment	Good.
Monolith joints	No seepage evident.
Construction joints	No seepage evident.

APPENDIX B

PLANS, RECORDS & PAST INSPECTION REPORTS

NEW YORK LICENSE 4755
ONNECTICUT REGISTRATION 4

JOSEPH W. CONE
CIVIL ENGINEER
124 HAVEMEYER PLACE
GREENWICH, CONNECTICUT

TELEPHONE
GREENWICH 8-215

STATE WATER RESOURCES
COMMISSION
RECEIVED

February 28, 1961

Mr. Merwin E. Hupfer
Senior Sanitary Engineer
Water Resources Commission
State Office Building
Hartford 15, Conn.

Re: North Stamford Dam #17
Stamford Water Co.

Dear Mr. Hupfer:

On Feb. 20, 1961, with Roger C. Brown, I inspected foundation and work to date on the spillway extension for the above captioned dam.

Ledge foundation is massive, generally fine grained blue-gray granite, with occasional pinkish pegamatite dikes a few inches thick. Joints, both horizontal and vertical, are thin, tight, and roughly at right angles. I noticed no wide fault planes that might be water conveying.

Old concrete in core wall is of very good quality.

Enclosed are photographs for record purposes. One shows a man standing at a joint in the old core wall where there is a small leak. It is proposed to pressure grout this rock seam and joint in old concrete after base concrete has been poured.

The project is proceeding satisfactorily insofar as the Commission is involved and foundation is approved for pouring of concrete.

Yours very truly,

J. W. Cone

JWC/dr
Enc: 6 photos
cc: Mr. Roger C. Brown

North Stamford Dam

The Certificate of Approval dated September 19, 1961 was superceded by the attached Certificate dated October 2, 1961 in order to remove the incorrect 126' spillway length. The original plans showed a 130' spillway with 2 - 2 piers, giving an effective length of 126'. The piers were not constructed, giving an effective length of the entire 130'.

MERWIN E. HUPFER
PRINCIPAL ENGINEER

THIS CERTIFICATE SUPERSEDES THE
CERTIFICATE ISSUED SEPTEMBER 19, 1[illegible]

FORM D-7

STATE OF CONNECTICUT
WATER RESOURCES COMMISSION
Room 317, State Office Building
Hartford, Connecticut

CERTIFICATE OF APPROVAL

Date Oct. 2, 1961

To: Stamford Water Company
103 Summer Street
Stamford, Connecticut

NAME OF STRUCTURE: North Stamford Dam

This is to certify that the following construction work:
Lengthening of spillway and installation of 12-inch collapsible type flashboards at the subject dam in accordance with "as-built" plans consisting of two sheets marked M-754 and M-688 respectively, certified on September 14, 1961 to show the spillway and flashboards substantially as constructed, and prepared by Clarence Blair Associates, Inc., an approved set of which is enclosed,

on your property on Rippowam River

in the Town (s) of Stamford

for which construction permit was issued December 7, 1960, has been completed to the satisfaction of this Commission and that such structure is approved as of date of this Certificate.

WATER RESOURCES COMMISSION

BY: William S. Wise
William S. Wise, Director

Enclosure: Plans

Note: The owner is required by law to record this Certificate in the land records of the town or towns in which the dam, dike or similar structure is located.

June 21, 1972

Mr. Arthur Bell, President
Stamford Water Company
103 Summer Street
Stamford, Connecticut 06901

Re: North Stamford Reservoir
Laurel Reservoir
Stamford

Dear Mr. Bell:

The undersigned inspected the subject dams on June 16, 1972.

I had the pleasure of meeting your engineer, Mr. Charles McInerney, at the North Stamford Reservoir site. As mentioned to him, your company should be commended for its maintenance program at these two sites. Both dams appeared to be in good condition with the exception of minor maintenance requirements.

Small tree growth that has started on the dam at the North Stamford Reservoir should be removed. A program of woodchuck control must be adopted to prevent burrowing of holes into the embankments.

At Laurel Reservoir the woodchuck population is even greater. The brush growth found on the dam is not objectionable from the standpoint of dam safety, however its removal might discourage woodchucks from the area. Minor deterioration of concrete in various areas on top of the dam are not of a serious nature but from the standpoint of good maintenance and appearance should be repaired.

May we hear of your intentions in regard to these matters.

Very truly yours,

Victor F. Galgowski
Supt. of Dam Maintenance

VFG:lj

CLARENCE BLAIR ASSOCIATES
Civil and Sanitary Engineers
93 WHITNEY AVENUE
P. O. BOX 236
NEW HAVEN 2, CONNECTICUT
TEL. 777-7379

ROGER C. BROWN
JAMES C. BEACH
FRANK RAGAINI

CLARENCE M. BLAIR
(1904-1944)

CHARLES E. AUGUR JR.
GORDON BILIDES
JOHN M. BREST
DONALD L. DISBROW
NICHOLAS PIPERAS JR.

October 28, 1963

Stamford Water Company
103 Summer Street
Stamford, Connecticut

Re: Safety of Dams

Attention: Mr. William M. Conron, President

Gentlemen:

At your request we have made inspections of the dams impounding the storage reservoirs of your Company.

There are four of these dams, all on Mill or Rippowan River or some of its tributaries. The four dams will be discussed in the following order.

1. North Stamford
2. Laurel
3. Mead Pond
4. Trinity Lake

1. North Stamford Dam is the most southerly of the four dams and is located about 3,000 feet northerly of the Merritt Parkway. It was constructed in 1908-1909 and impounds North Stamford Reservoir, covering an area of 114 acres and having a total capacity of 512 million gallons. Spillway level of the dam is 196 feet above mean high water in Stamford Harbor.

The easterly portion of the dam, about 420 feet in length is a gravity section dam of concrete, founded on a ledge rock, with a maximum height of about 65 feet. The top of the dam is four feet above the spillway level. The downstream face of the gravity section is covered by earth embankment up to about 10 feet below the top of the dam. From the westerly end of the gravity section for about 410 feet westerly, the dam is of earth embankment with a heavy concrete corewall founded on ledge rock. The earth embankment has a slope of one vertical on two horizontal on both upstream and downstream sides, the upstream side being covered with a 12 inch layer of stone riprap.

Westerly of the embankment and corewall section is the original spillway, 150 feet long, consisting of a gravity ogee section of concrete founded on ledge rock. Maximum height of the spillway section is about 27 feet.

Westerly of the original spillway, an additional spillway 130 feet in length was constructed in 1960 and 1961. This is a gravity overflow section of concrete placed on and over the original concrete corewall in this section. Overflow level is the same as on the original spillway. Total length of spillway is now 280 feet.

Certified "as built" plans of the original dam show that the design of the gravity sections included ample factors of safety. The corewall section used in the embankment is unusually heavy.

The spillway, as presently constructed, has an estimated discharge capacity of approximately 7900 cubic feet per second at full depth of 4 feet. The total drainage area tributary to this dam is 21.49 square miles, so the spillway has a discharge capacity of 368 cubic feet per second per square mile. The estimated peak discharge at this dam during the flood of 1955, the flood of record in this vicinity, was 200 cubic feet per second per square mile.

Based on inspection of the plans and of the structure itself, it is my opinion, that North Stamford Dam is conservatively designed and is entirely safe. Some surface disintegration and spalling off of sharp corners of the concrete is evident on the exposed surface of the gravity section of the dam. This surface deterioration is unsightly but in no way affects the safety of the structure.

~~2. Laurel Dam is north of North Stamford Reservoir and is about~~ 6000 feet southerly of the New York State line. It was constructed in 1923-24 and impounds Laurel Reservoir, covering an area of 265 acres and having a total capacity of 2253 million gallons. Spillway level is 310 feet above mean high water in Stamford Harbor.

The dam is a gravity section concrete structure, founded on ledge rock, about 1680 feet in length with a maximum height of 63 feet. The downstream face of the dam is covered with embankment up to a level about 10 feet below the top of the dam. At the westerly end of the main dam, there is a concrete spillway section 100 feet long and 5 feet deep. Maximum height of the spillway section is about 15 feet. Westerly of the spillway section there is about 120 lineal feet more of gravity section dam with embankment. The spillway has an estimated discharge capacity of approximately 3700 cubic feet per second at full depth of 5 feet. The total drainage area tributary to Laurel Dam is 13.43 square miles. The ~~spillway then has a discharge capacity of 275 cubic feet per second per~~ square mile.

203 869-0136

ESTABLISHED 1887

S. E. MINOR & CO., INC.
CIVIL ENGINEERS
161 MASON STREET
GREENWICH, CONNECTICUT 06830

October 2, 1975

State of Connecticut
Department of Environmental Protection
State Office Building
Hartford, Connecticut 06115

Attention: Mr. Victor F. Galgowski
Superintendent of Dam Maintenance
Water and Related Resources

N. STAMFORD R.
Re: ~~Laurel Reservoir Dam~~

Dear Mr. Galgowski:

In accordance with your request, we have examined the subject dam in order to ascertain its structural soundness and stability. Prior to our visit to the site, we went to the Town Hall offices and attempted to obtain any structural drawings of the subject installation. We were advised that no plans were on file and that the Town officials had no knowledge whatsoever of the construction of the dam.

Upon visiting the site, we found the structure to be a combination concrete and earthen dam containing two major spillways. The overall length of the dam and spillways is approximately 875 feet. In addition, there are two valve houses in the vicinity of the concrete portion of the dam; one at the end, and the other approximately at the center. The concrete portion of the dam has an earthen face with approximately a one on one slope. Said slope is fully covered with vegetation.

The earthen portion has a downstream slope of approximately one on three, and the back of the dam is earth with boulders and loose riprap at a slope of approximately one on two. The spillway sections are approximately 125 feet in length separated by reinforced concrete cheek walls. Atop each spillway there are timbers which can be used to adjust the level of the reservoir. The spillways are shaped generally in accordance with the typical section on the enclosed drawing. Said drawing indicates the approximate layout of the entire structure.

In the earthen section there was no evidence of leaks, boils, or fissures; and, in general, the vegetation seems to be well maintained. Atop the concrete section of the dam in the vicinity between the gate houses, the top of the concrete is badly spalled in many areas and should be pointed up. The masonry spillways have several cracks which also should be cleaned out and pointed up. These things I would consider in normal maintenance and perhaps should be taken care of prior to the freezing weather this winter.

In general, it is our considered opinion that Laurel Reservoir Dam is in excellent condition and if maintained as stated above should serve the community for many years to come.

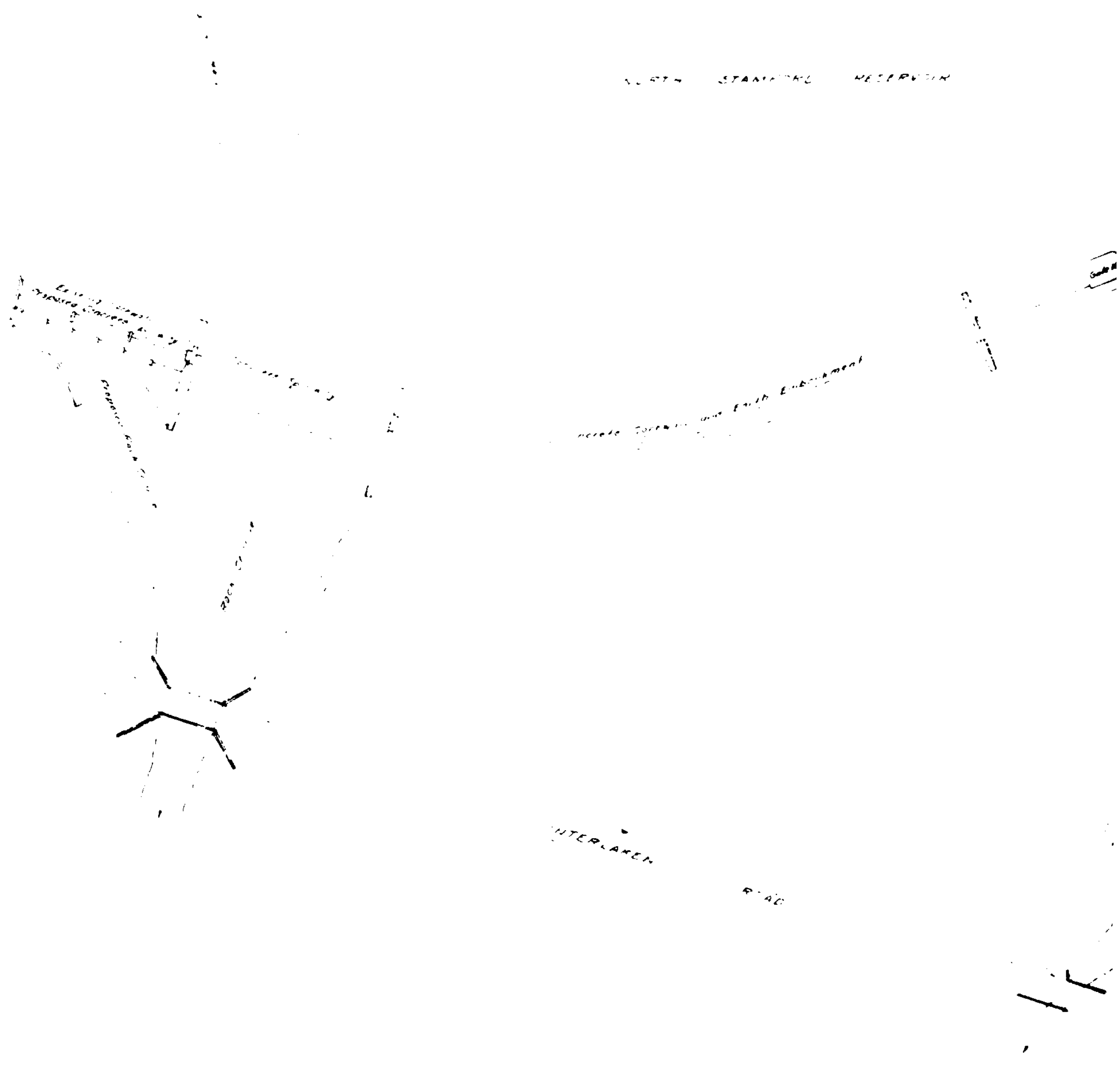
Should you have any questions regarding this report, feel free to contact me.

Respectfully submitted,

S. E. MINOR & CO., INC.

Edward F. Ahneman, Jr., P.E.
Chief Engineer

EFA:lb
Enclosure

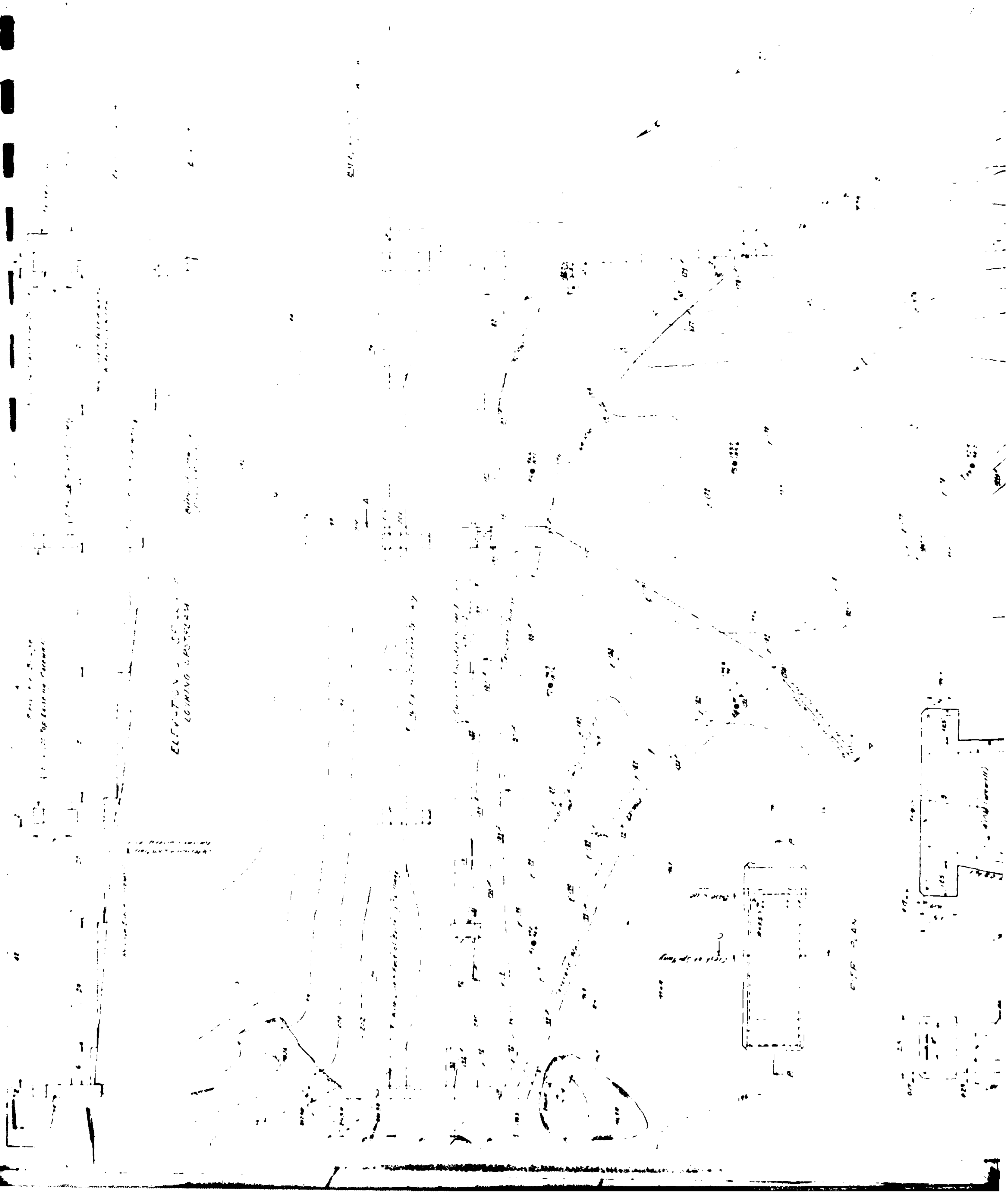


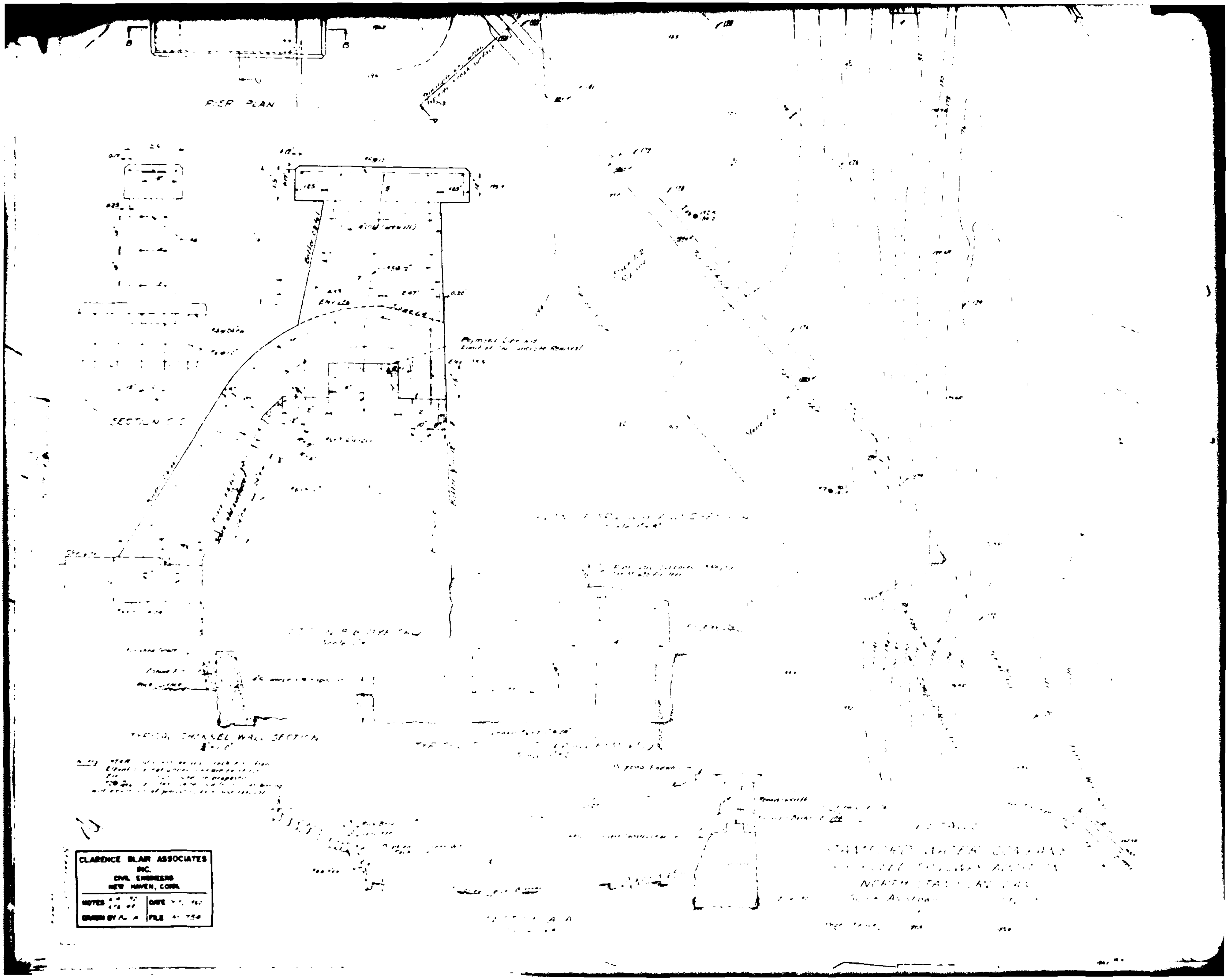
CLARENCE BLAIR ASSOCIATES
INC.
CIVIL ENGINEERS
NEW HAVEN, CONN.

NOTES [illegible]	DATE [illegible]
DRAWN BY [illegible]	FILE [illegible]

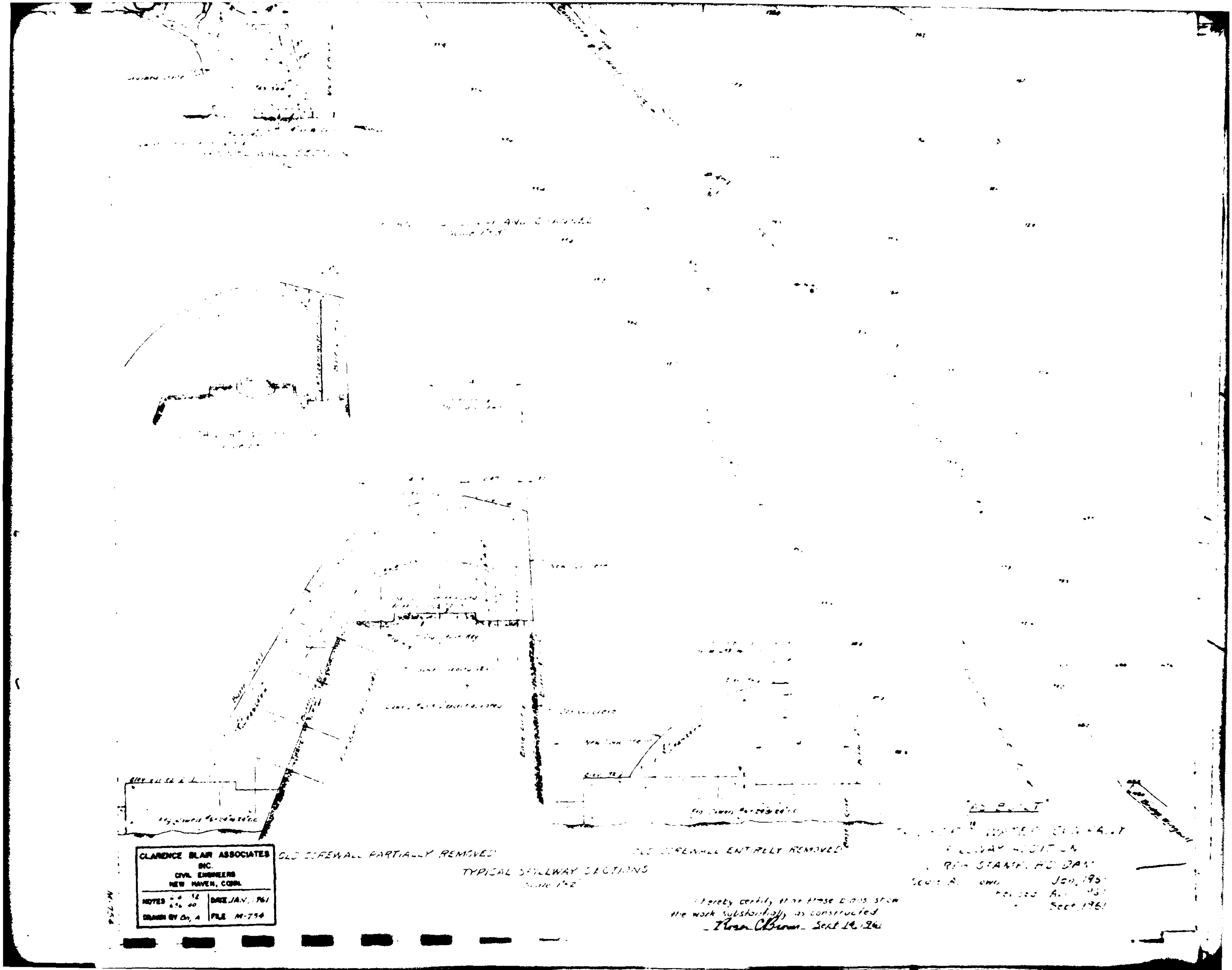
APPRO[illegible]ED
IN ACCORDANCE WITH POLIC[illegible] [illegible]OCEDURE OF
STATE WATER RESOU[illegible]S COMMISSION
BY William S. Wise
WILLIAM S. WISE DIRECTOR
DATE DEC 7 1960

[illegible]ENERAL PLAN
STAMF[illegible] WATER [illegible]
PROPOSED S[illegible] AD[illegible]N
N[illegible] [illegible]AM
Scale [illegible]





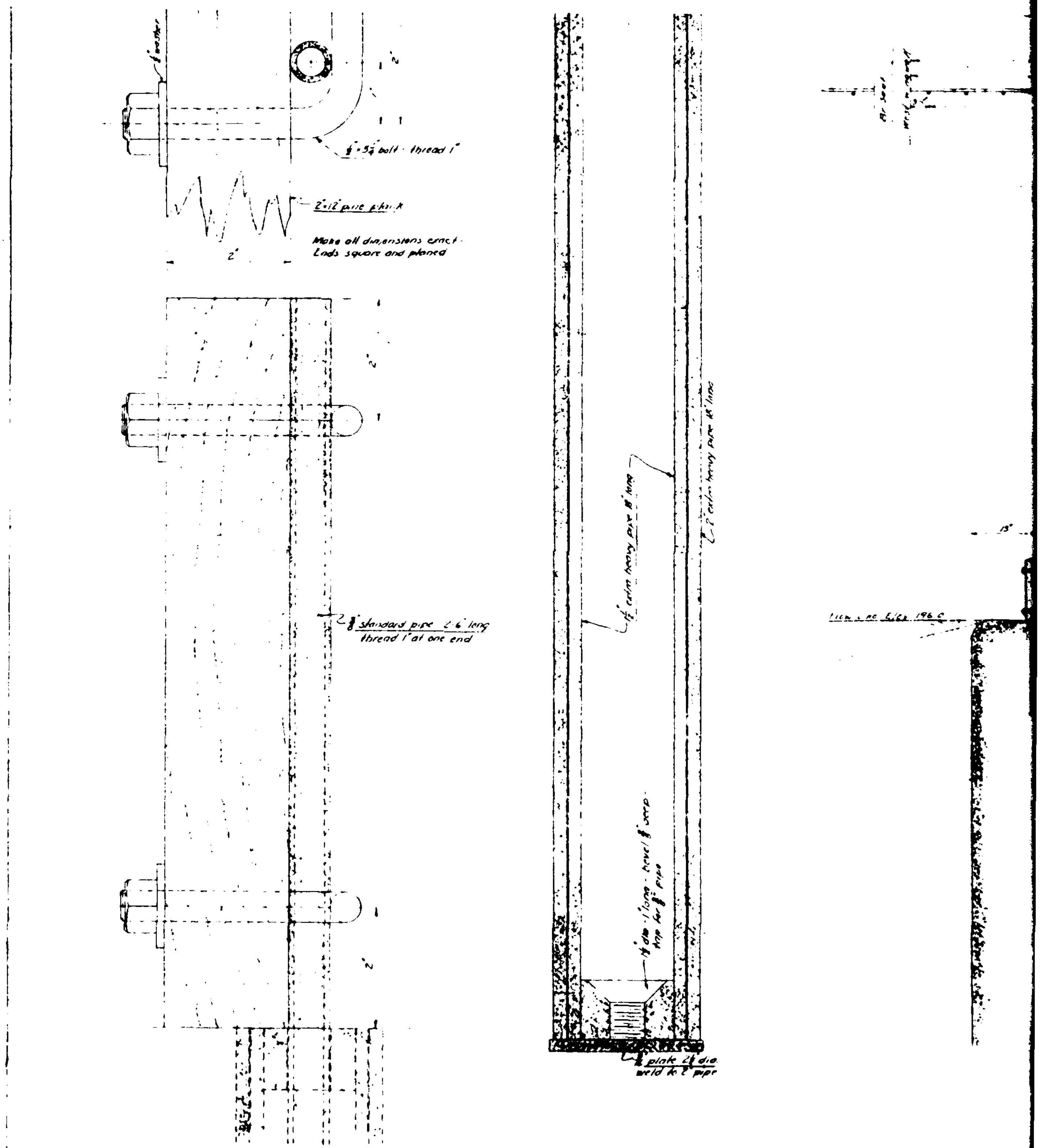
PIER PLAN
SECTION C-C
TYPICAL CHANNEL WALL SECTION
CLARENCE BLAIR ASSOCIATES
INC.
CIVIL ENGINEERS
NEW HAVEN, CONN.
NOTED
DATE
DRAWN BY
FILE



OLD COREWALL PARTIALLY REMOVED
OLD COREWALL ENTIRELY REMOVED
TYPICAL SPILLWAY SECTIONS
CLARENCE BLAIR ASSOCIATES
INC.
CIVIL ENGINEERS
NEW HAVEN, CONN.
DATE JAN., 1961
FILE M-754
M-754
I hereby certify that these plans show the work substantially as constructed.
Sept 14, 1961
Jan, 1951
Sept 1961

2

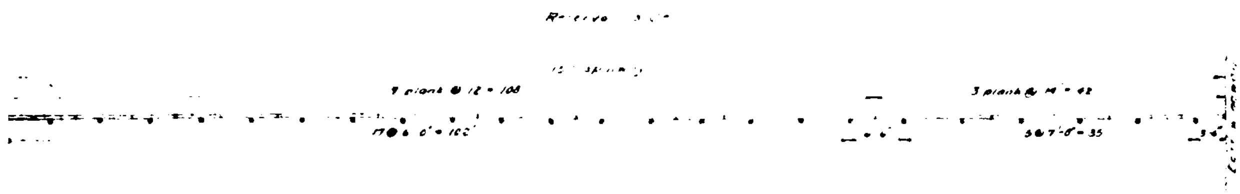
NORTH STAMFORD DAM
STAMFORD



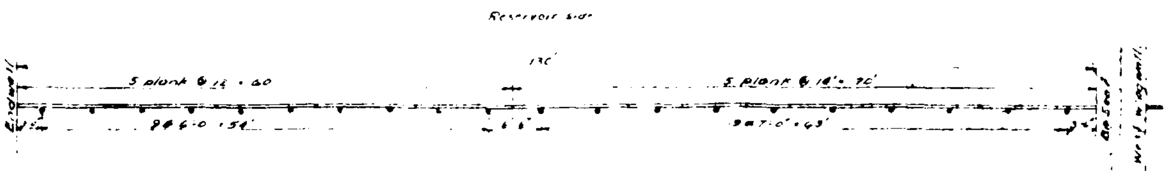
DETAIL OF FLASH BOARD AND SUPPORT

FULL SIZE

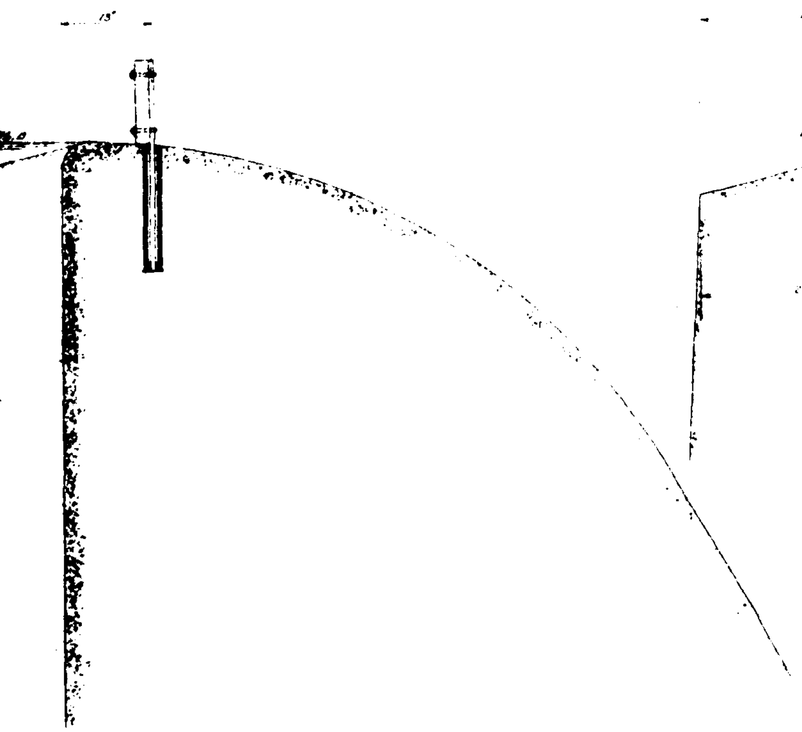
CLARENCE BLAIR ASSOCIATES INC. CIVIL ENGINEERS NEW HAVEN, CONN.	
NOTES	DATE NOV. 1938
DRAWN BY F.R.	FILE 39-688

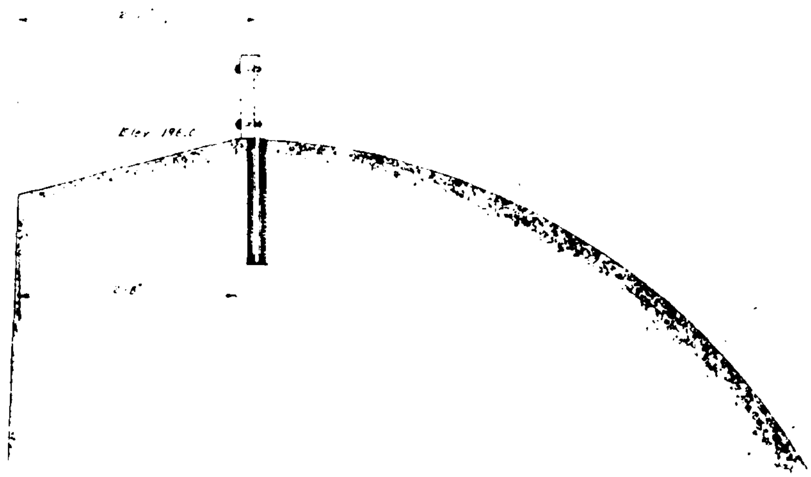


PLAN SHOWING LOCATIONS OF SUPPORTS
1" = 10'



PLAN SHOWING LOCATIONS OF SUPPORTS
FOR PROPOSED SPILLWAY ADDITION
1" = 10'





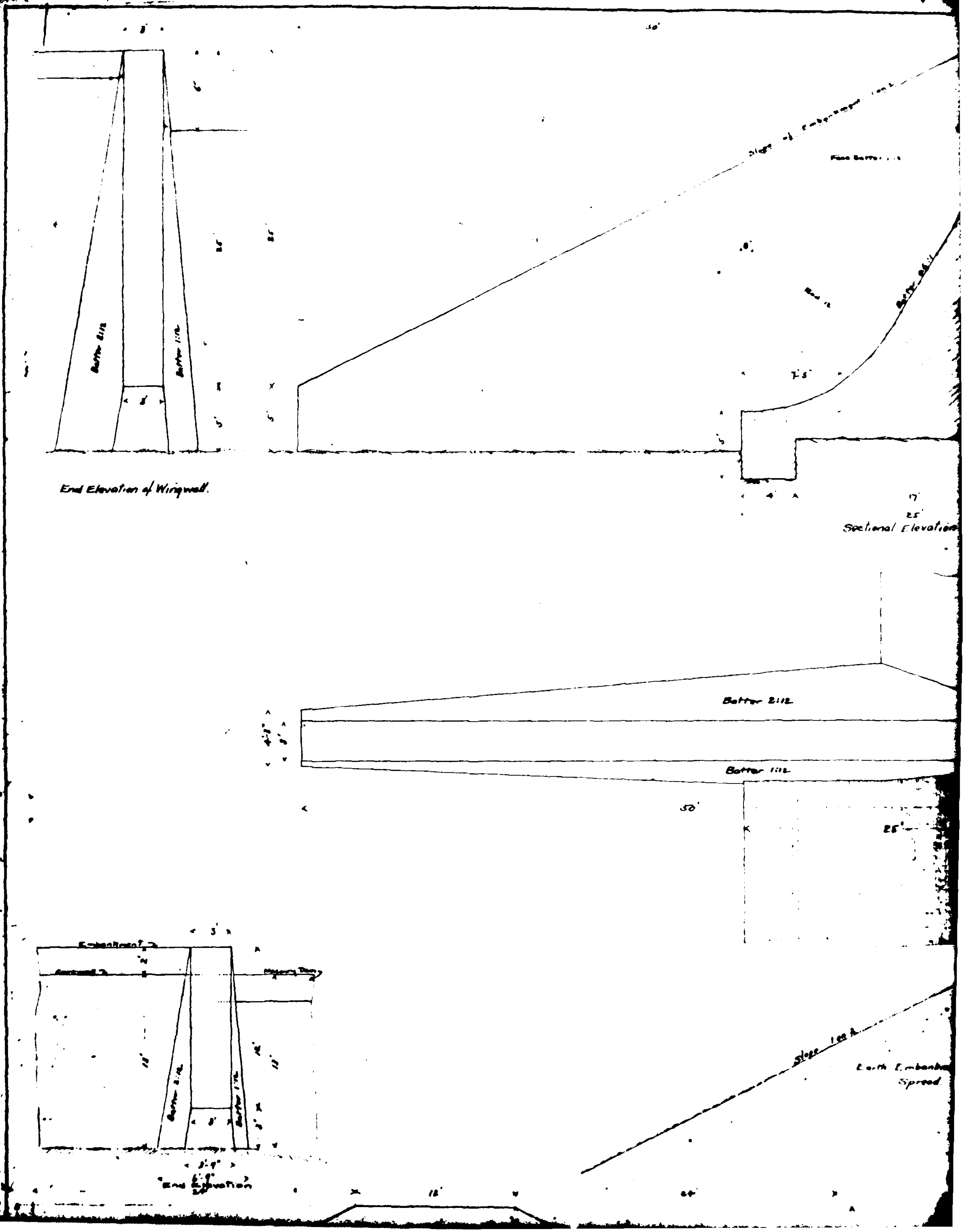
SECTION OF PROPOSED SPILLWAY ADDITION
1" = 1'

SECTION OF SPILLWAY
1" = 1'

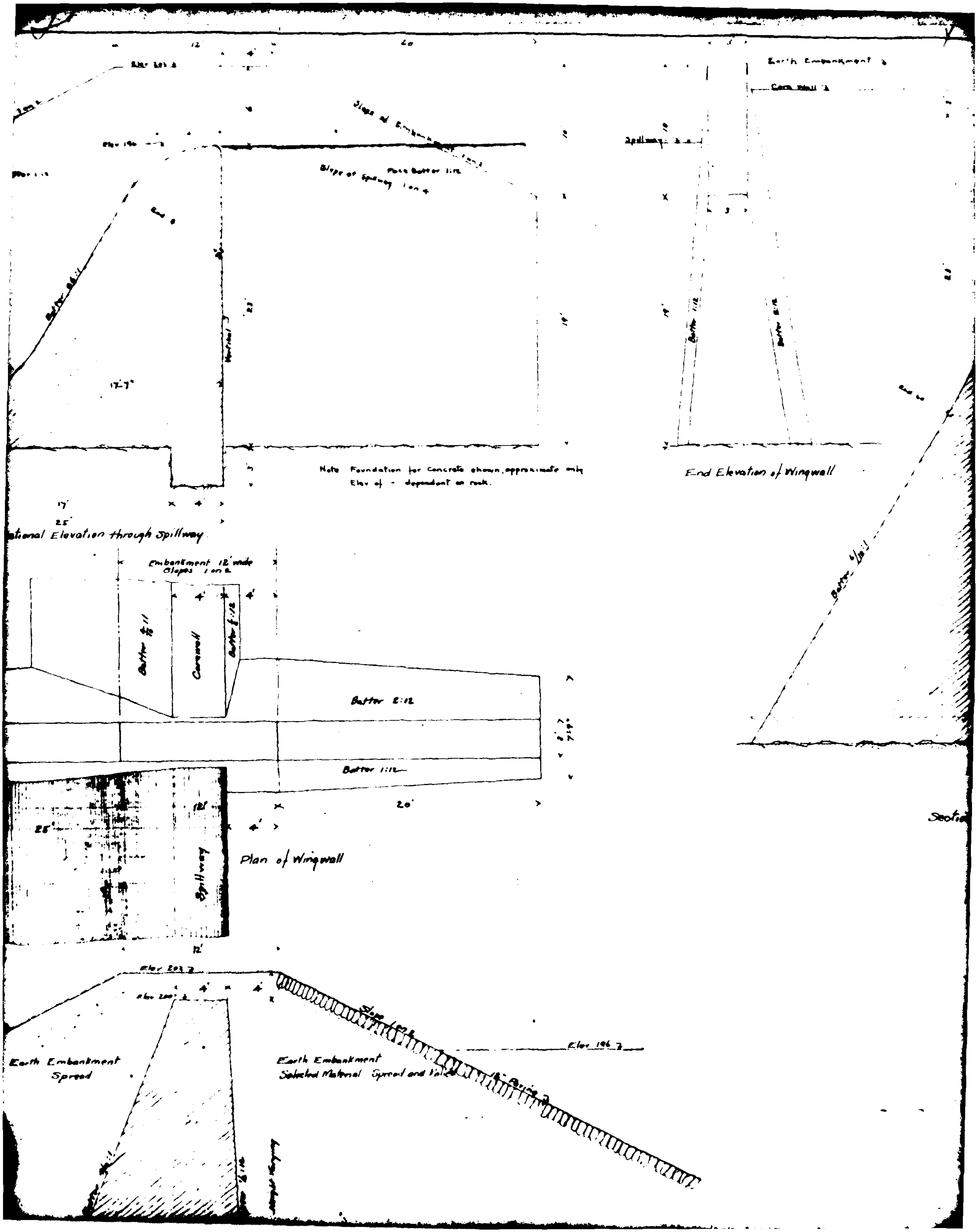
I hereby certify that these plans show
flashboards substantially as constructed in 1961
– Tom C. Bowm[?] Sept. 14, 1961

STAMFORD WATER COMPANY
FLASH BOARDS FOR NORTH STAMFORD DAM
STAMFORD, CONN.
SCALES AS SHOWN NOVEMBER, 1958
PROPOSED SPILLWAY ADDED OCT., 1960
PROPOSED SPILLWAY REVISED JAN. 1961

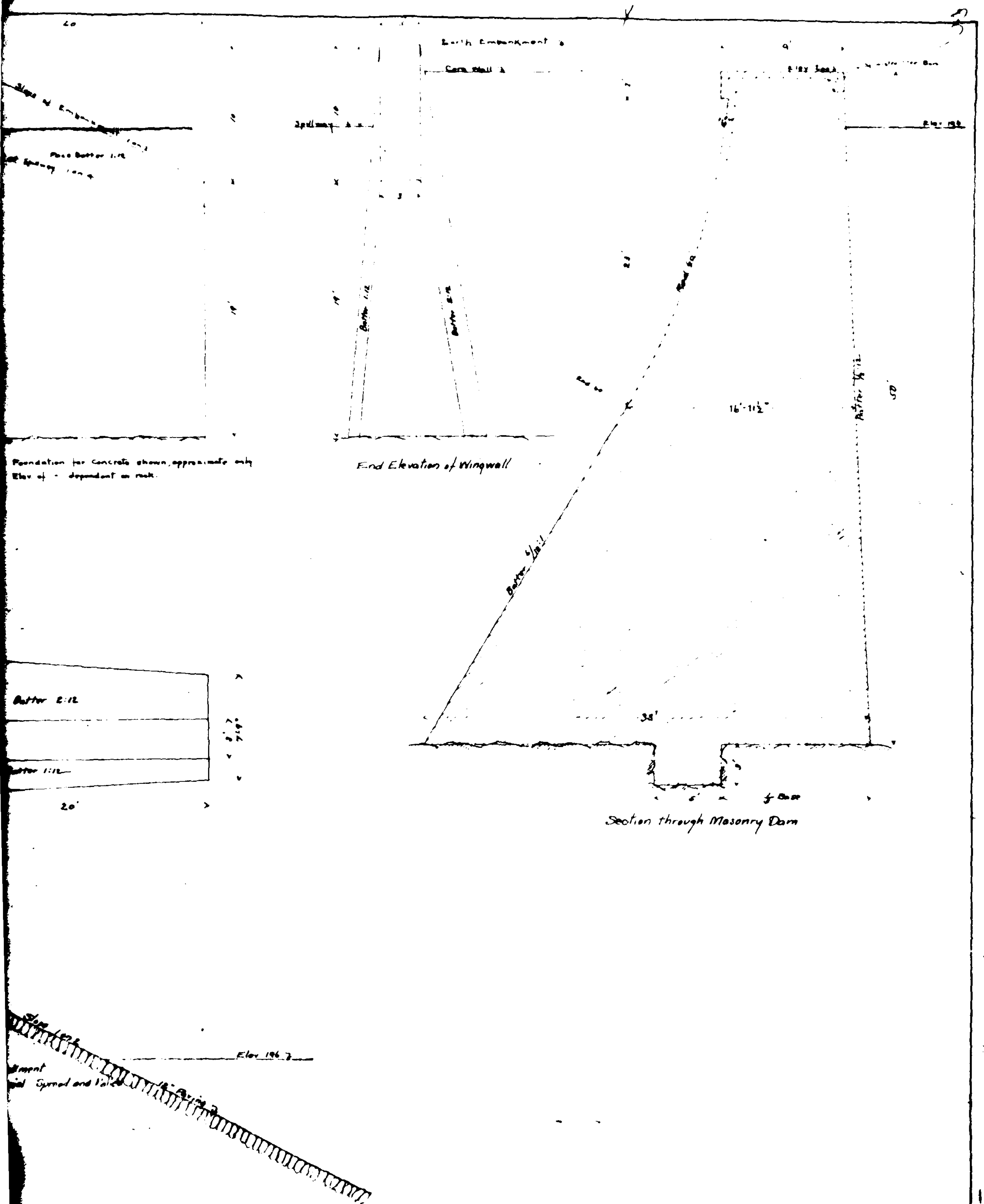
2



End Elevation of Wingwall.
Batter 2:12
Batter 1:12
Sectional Elevation
Batter 2:12
Batter 1:12
50'
25'
End Elevation
Earth Embankment
Spread

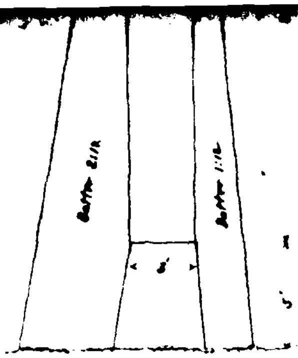


Earth Embankment
Core Wall
Spillway
Slope of Embankment 1 on 2
Slope of Spillway 1 on 4
Face batter 1:12
Vertical
Batter 1:12
Note Foundation for Concrete shown, approximate only
Elev of - dependent on rock.
End Elevation of Wingwall
tional Elevation through Spillway
Embankment 12' wide
Slopes 1 on 2
Batter 2:12
Corewall
Batter 1:12
Plan of Wingwall
Spillway
Elev 196
Earth Embankment
Spread
Earth Embankment
Selected Material Spread and Rolled
Sectio

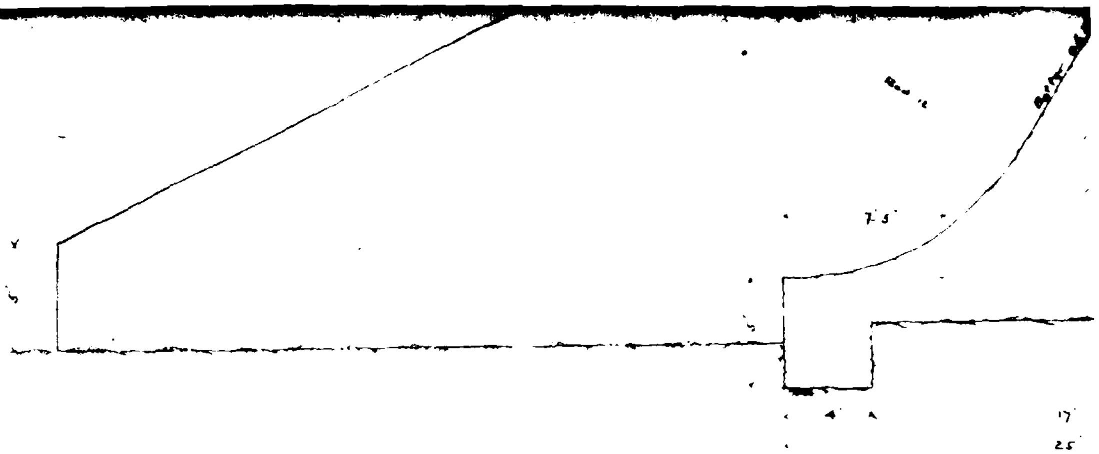


End Elevation of Wingwall

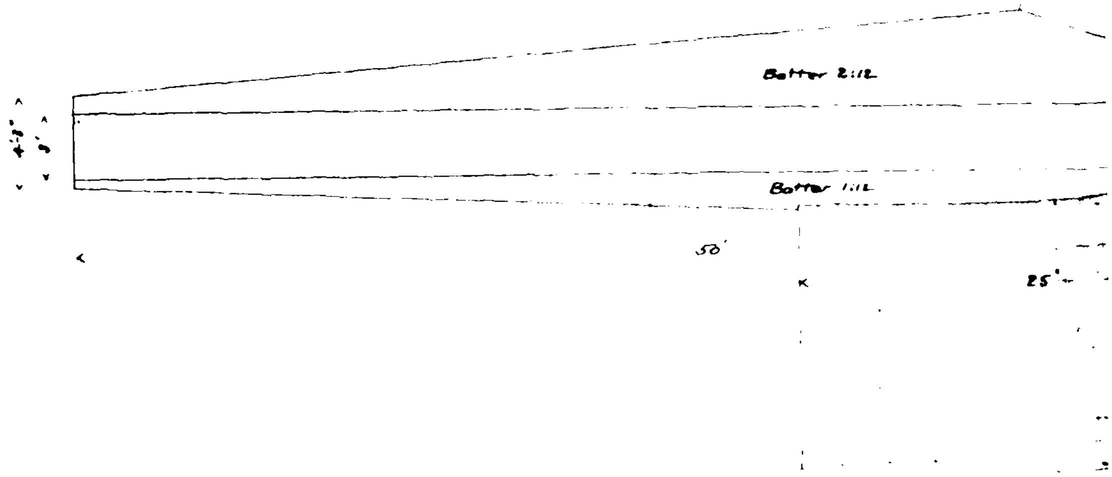
Section through Masonry Dam

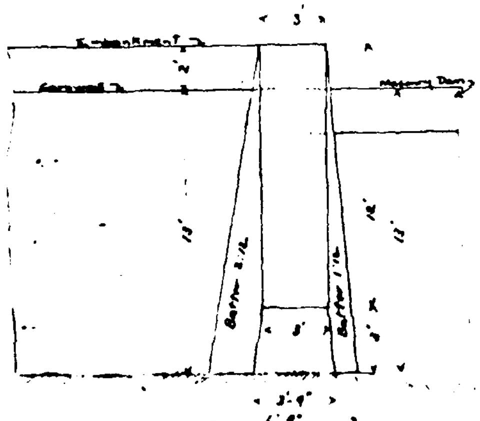


End Elevation of Wingwall.

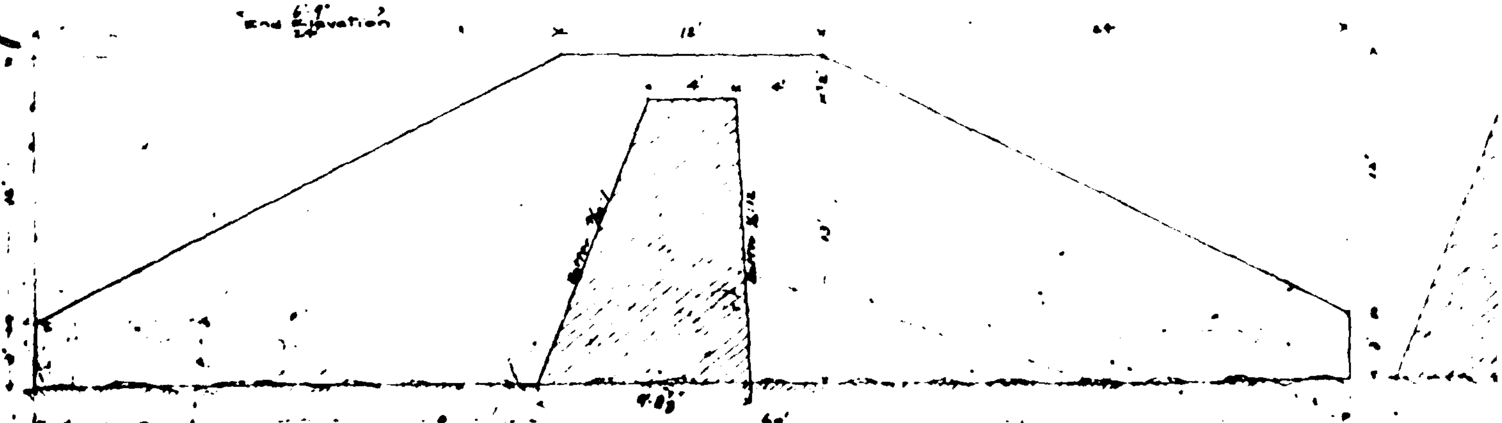


Sectional Eleva

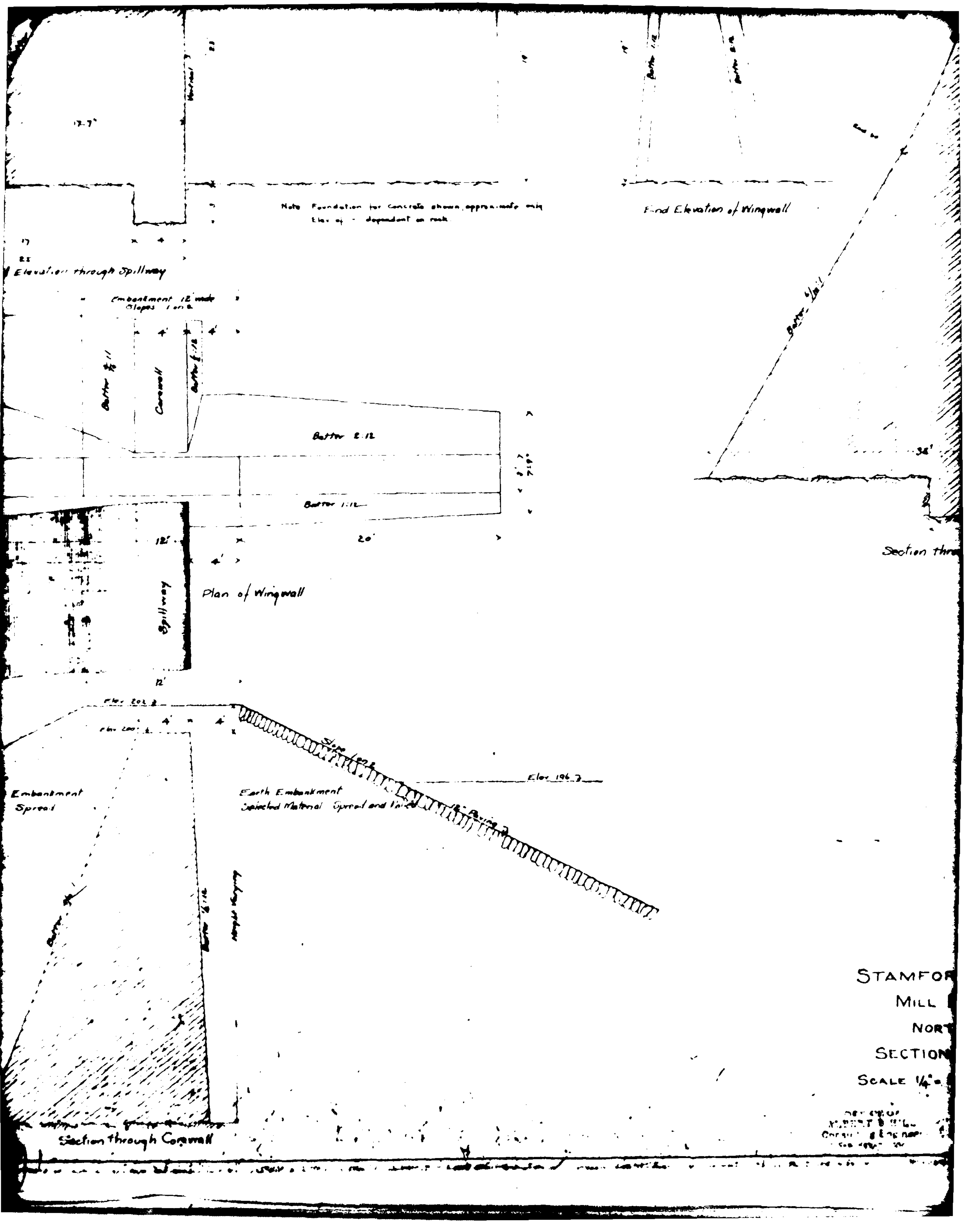




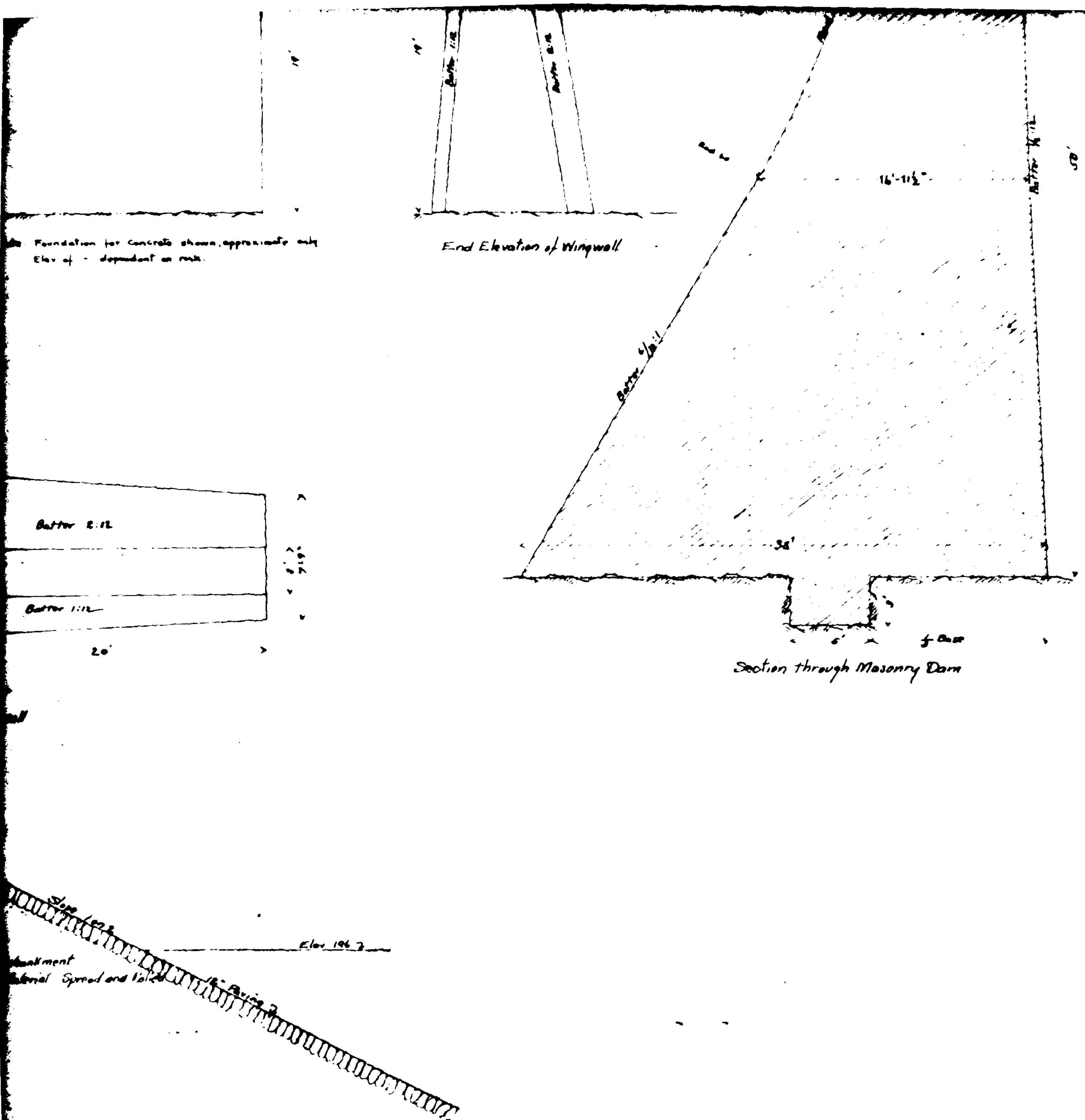
End Elevation



Wingwall at West End of Embankment.



Note Foundation for Concrete shown approximate only
Elev of dependent on rock
End Elevation of Wingwall
Elevation through Spillway
Embankment 12' wide
Slopes 1 on 2
Corewall
Batter 2:12
Batter 1:12
Spillway
Plan of Wingwall
Elev 196.7
Earth Embankment
Selected Material Spread and Rolled
Embankment
Spread
Section through Corewall
Section thr
STAMFOR
MILL
NORT
SECTION
SCALE 1/4"=



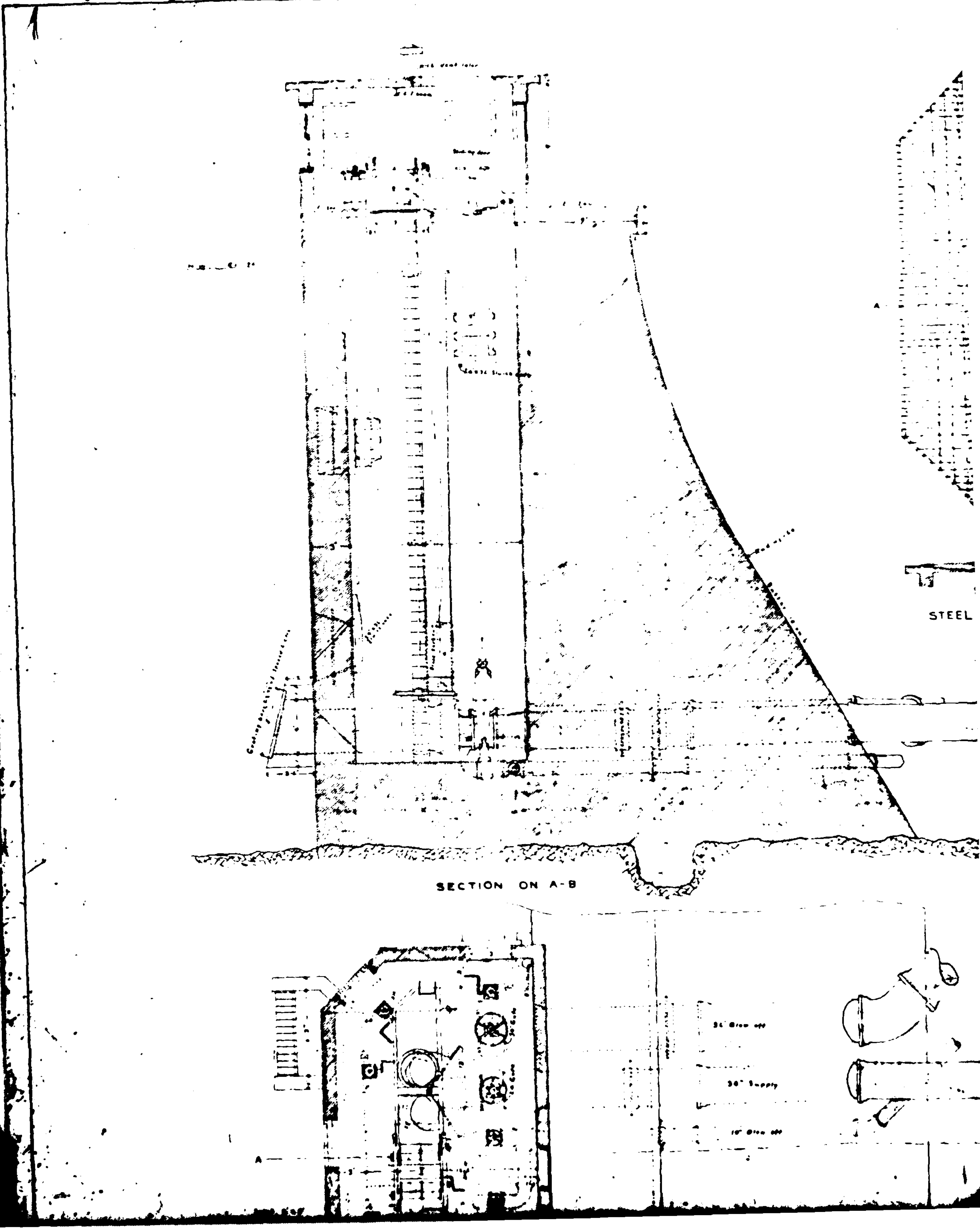
STAMFORD WATER COMPANY

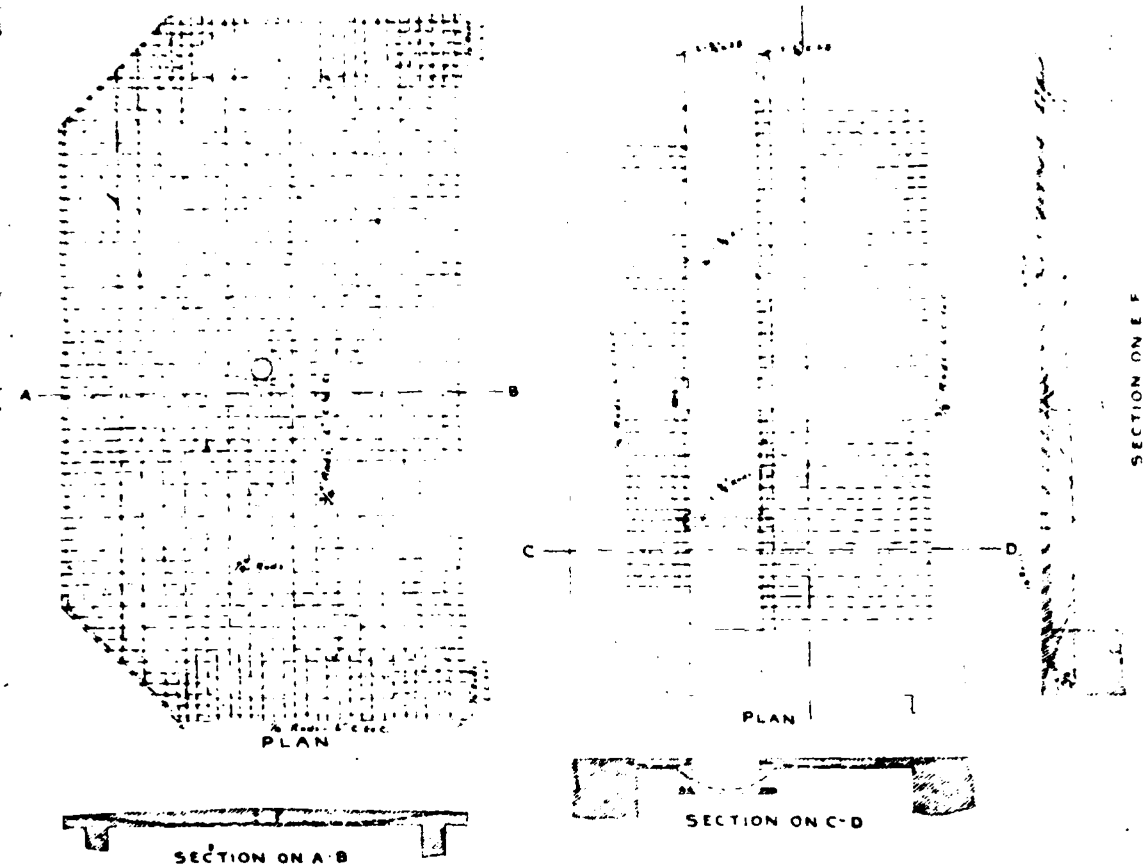
MILL RIVER RESERVOIR

NORTH STAMFORD CONN.

SECTIONS THROUGH DAM.

SCALE 1/4" = 1' August 20th 1908

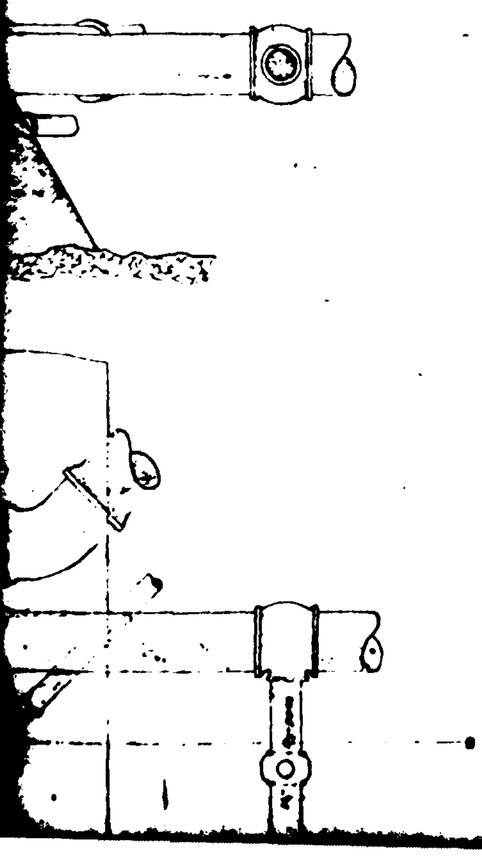

STEEL
SECTION ON A-B

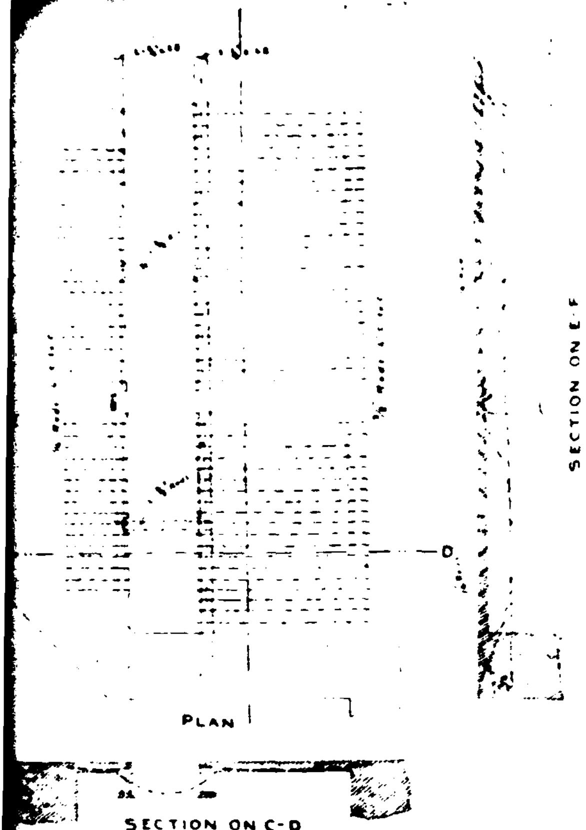


STEEL REINFORCMENT IN ROOF

STEEL REINFORCMENT IN FLOOR

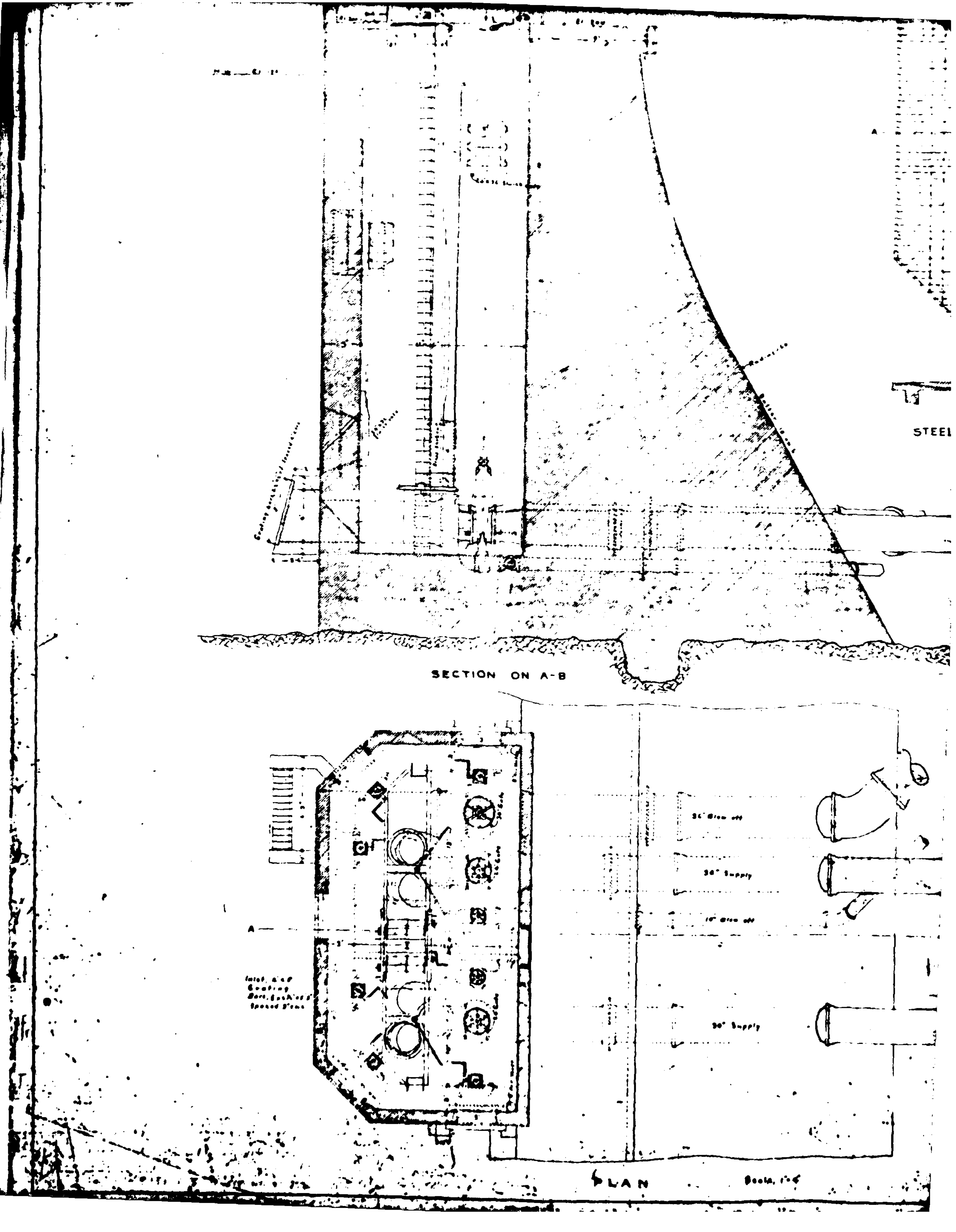
Scale, 1"=4'

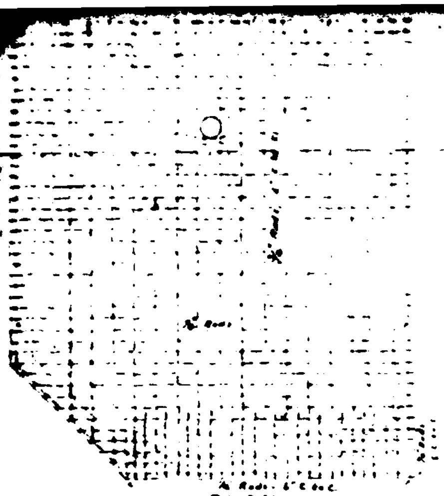




STEEL REINFORCMENT IN FLOOR

STAMFORD WATER COMPANY
MILL RIVER RESERVOIR
NORTH STAMFORD CONN

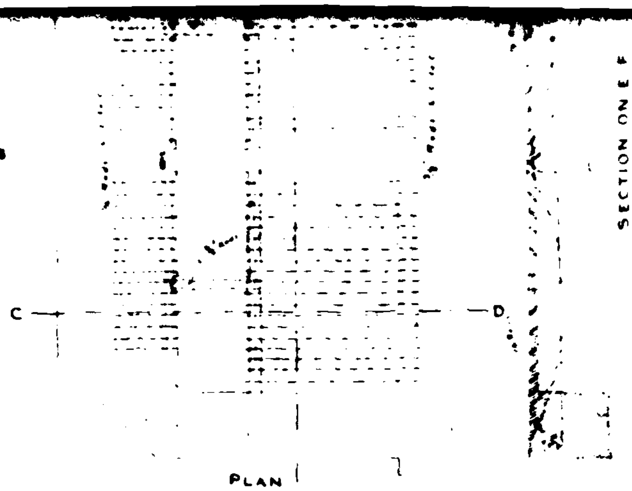

STEEL
SECTION ON A-B
A
36" Blow off
36" Supply
10" Blow off
30" Supply
PLAN
Scale, 1"=6'



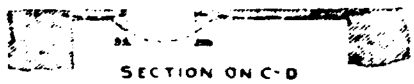
PLAN

SECTION ON A-B

STEEL REINFORCMENT IN ROOF



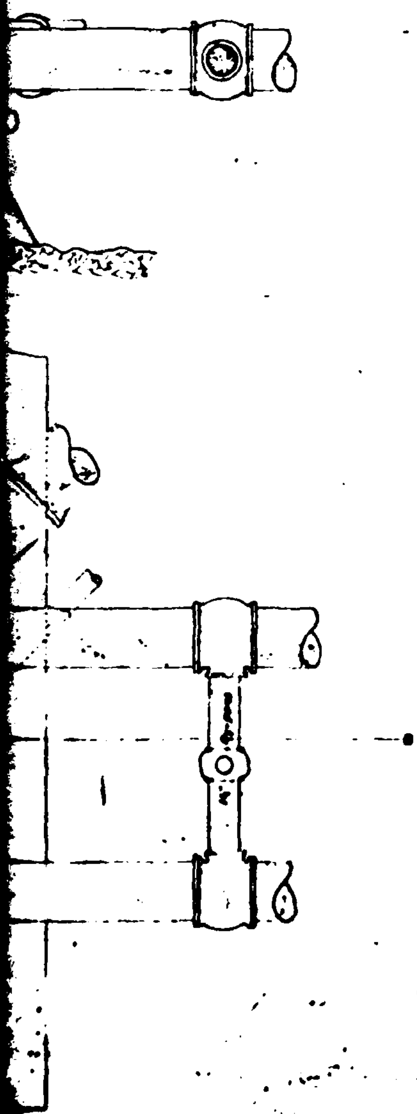
PLAN



SECTION ON C-D

STEEL REINFORCMENT IN FLOOR

Scale, 1"=4'



STAMFO

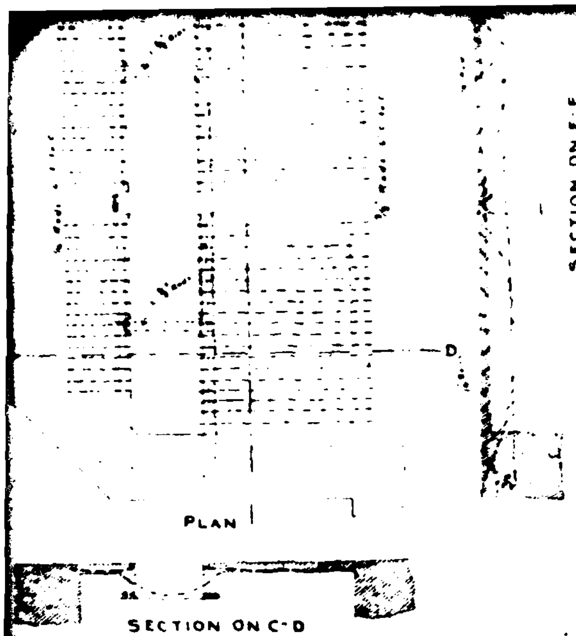
MILL

NOR

SCALE 1/8"

ALBERT B.

Consulting Engineer



STEEL REINFORCMENT IN FLOOR

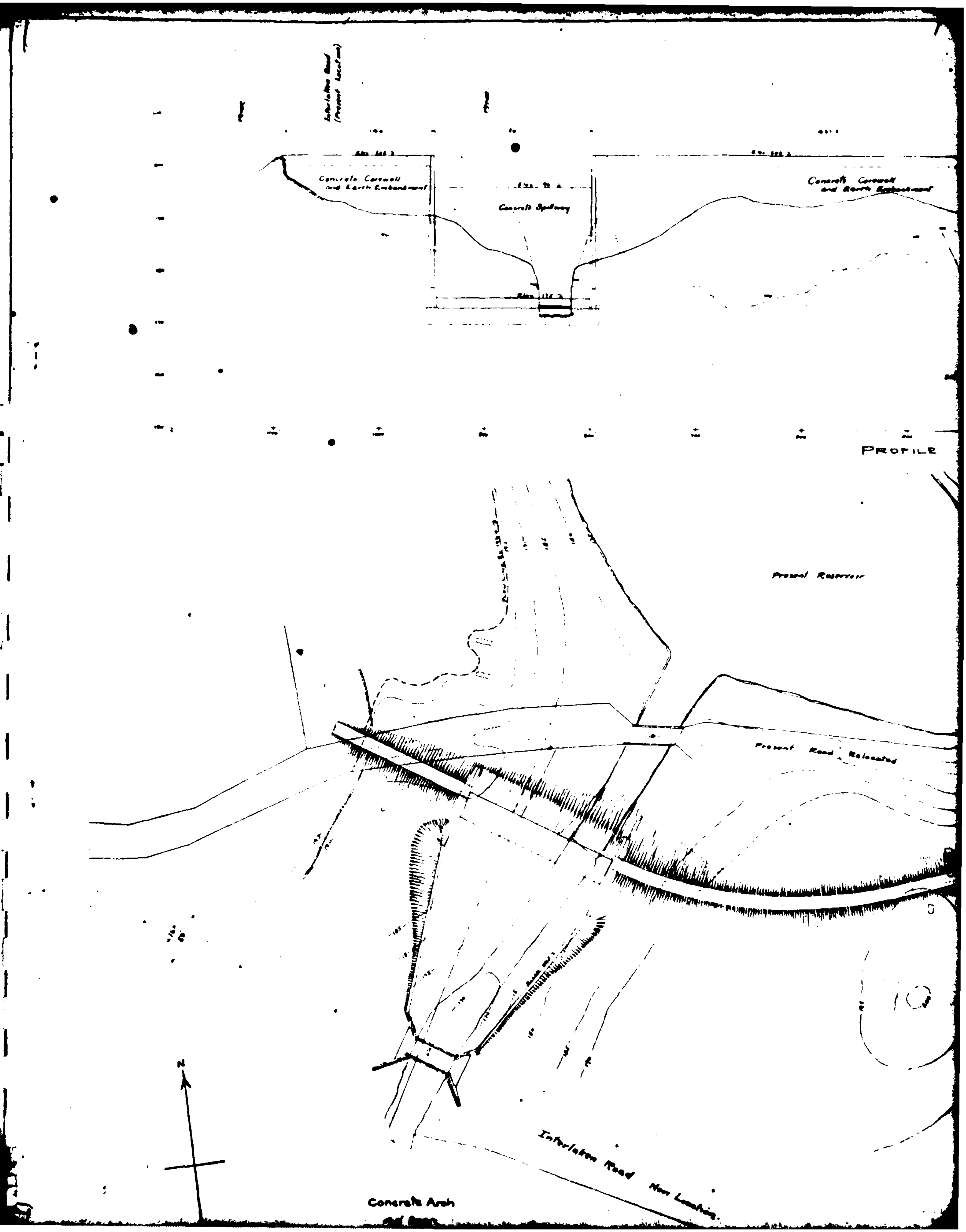
STAMFORD WATER COMPANY
MILL RIVER RESERVOIR
NORTH STAMFORD CONN
GATE HOUSE

L-20

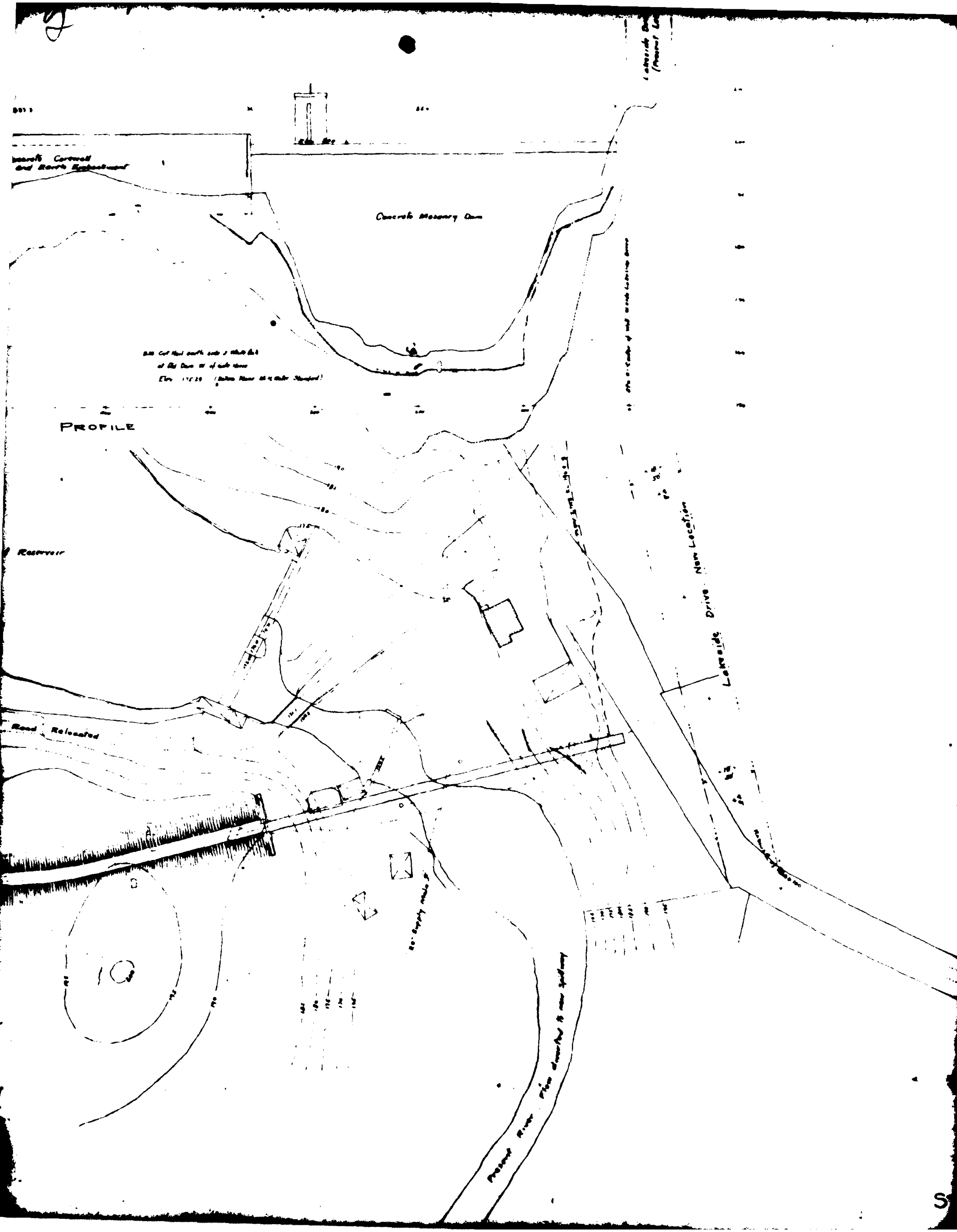
SCALE 1/4"=1'

August 20th 1908

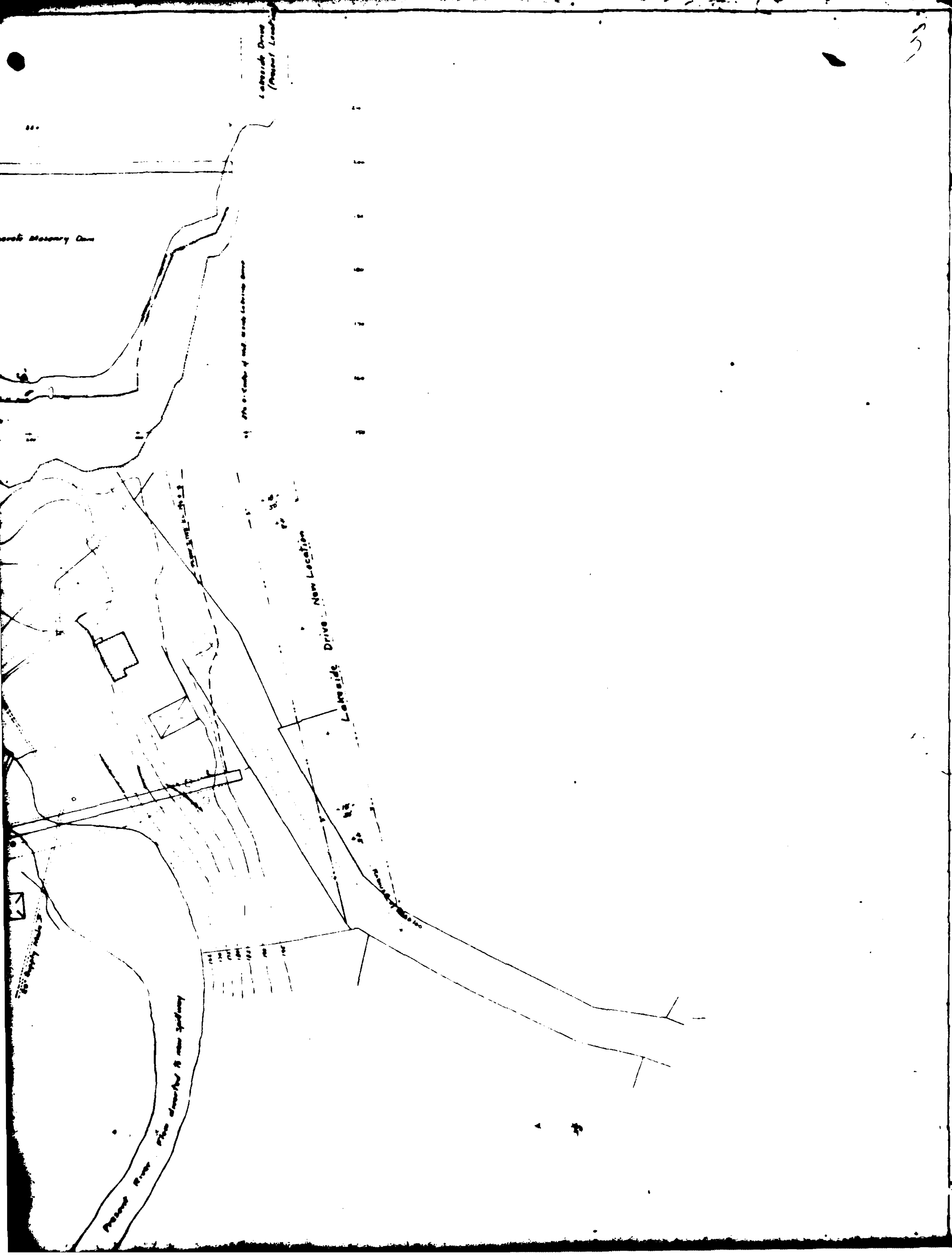
ALBERT B
Consulting



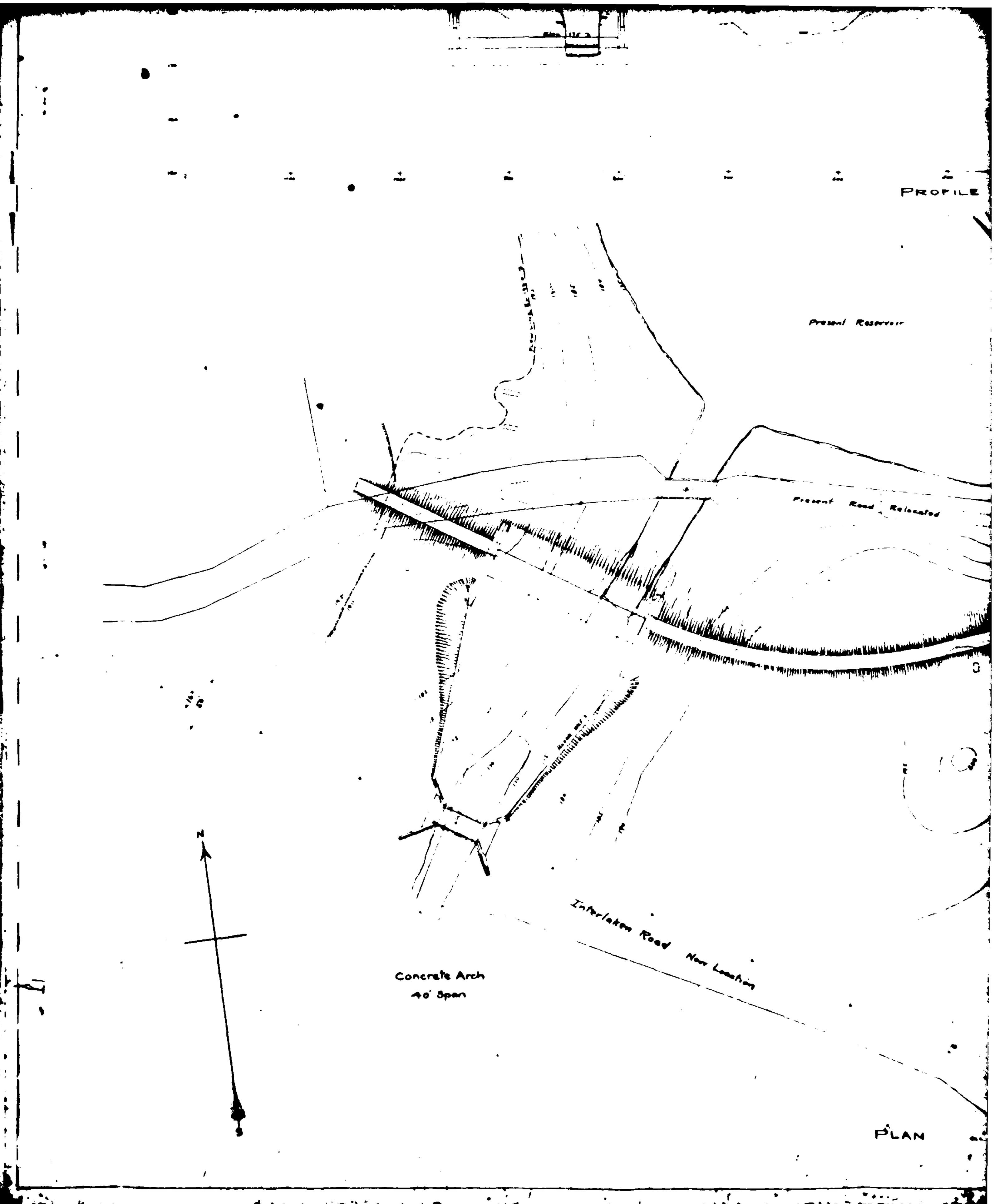
Concrete Corewall and Earth Embankment
Concrete Spillway
Concrete Corewall and Earth Embankment
PROFILE
Present Reservoir
Present Road Relocated
Interlaken Road New Location
Concrete Arch
N



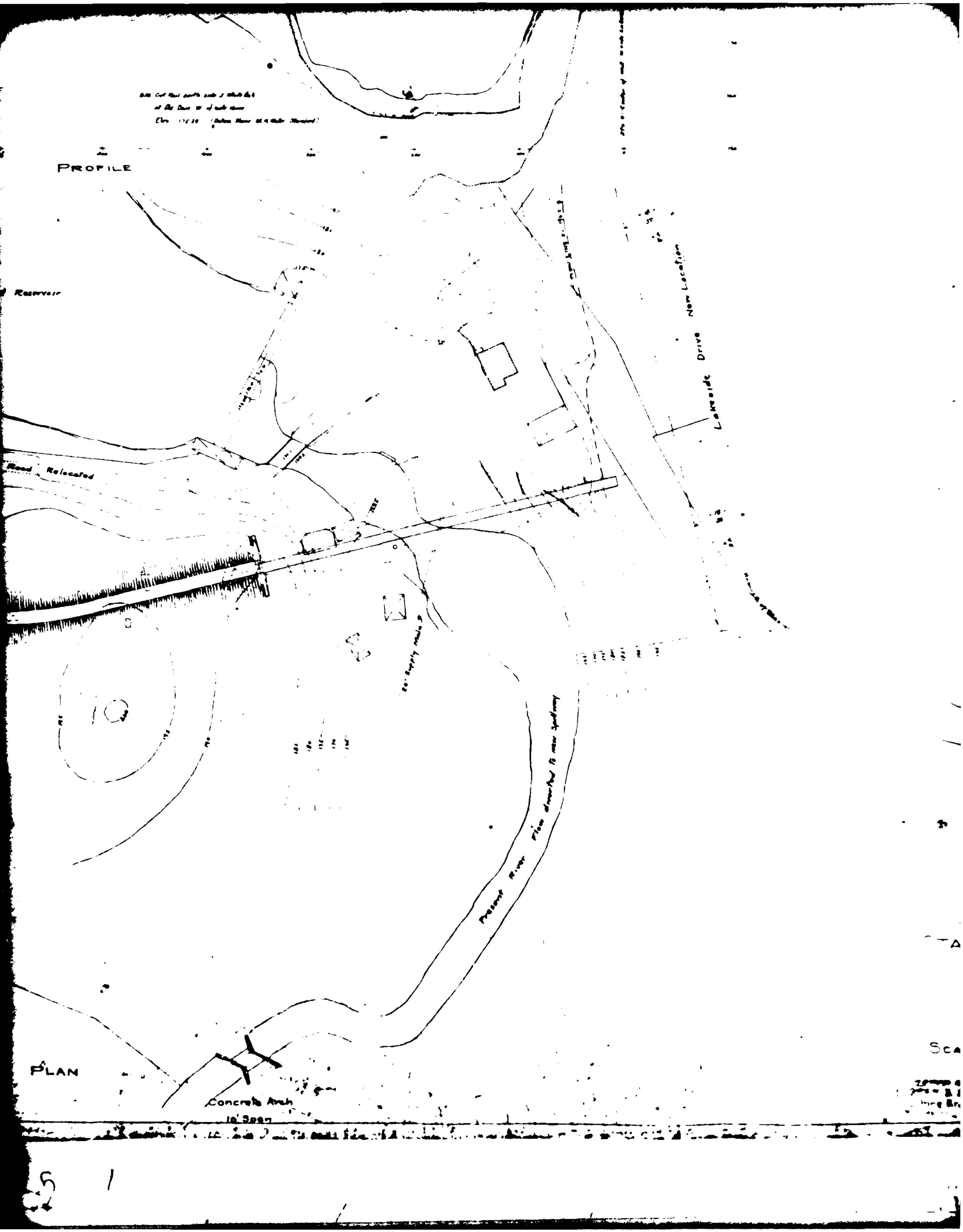
Concrete Masonry Dam
PROFILE
Reservoir
Road Relocated
Lakeside Drive New Location
10
Present River Flow diverted to new Spillway

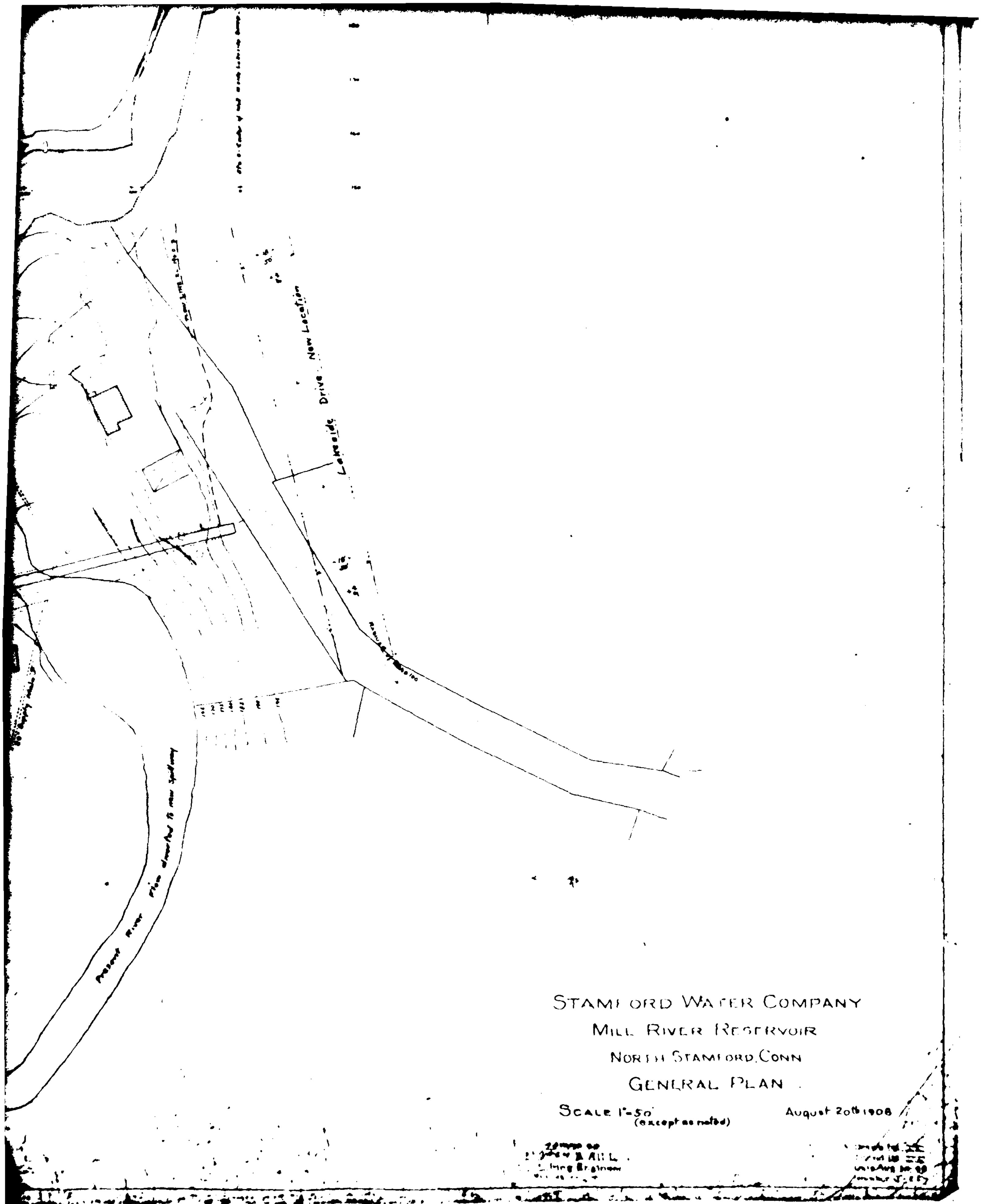


3


PROFILE
Present Reservoir
Present Road Relocated
Interlaken Road New Location
Concrete Arch
40' Span
N
S
PLAN

H


PROFILE
Reservoir
Road Relocated
New Location
Lakeside Drive
Present River Flow diverted to new Spillway
PLAN
Concrete Arch
10' Span
Sca

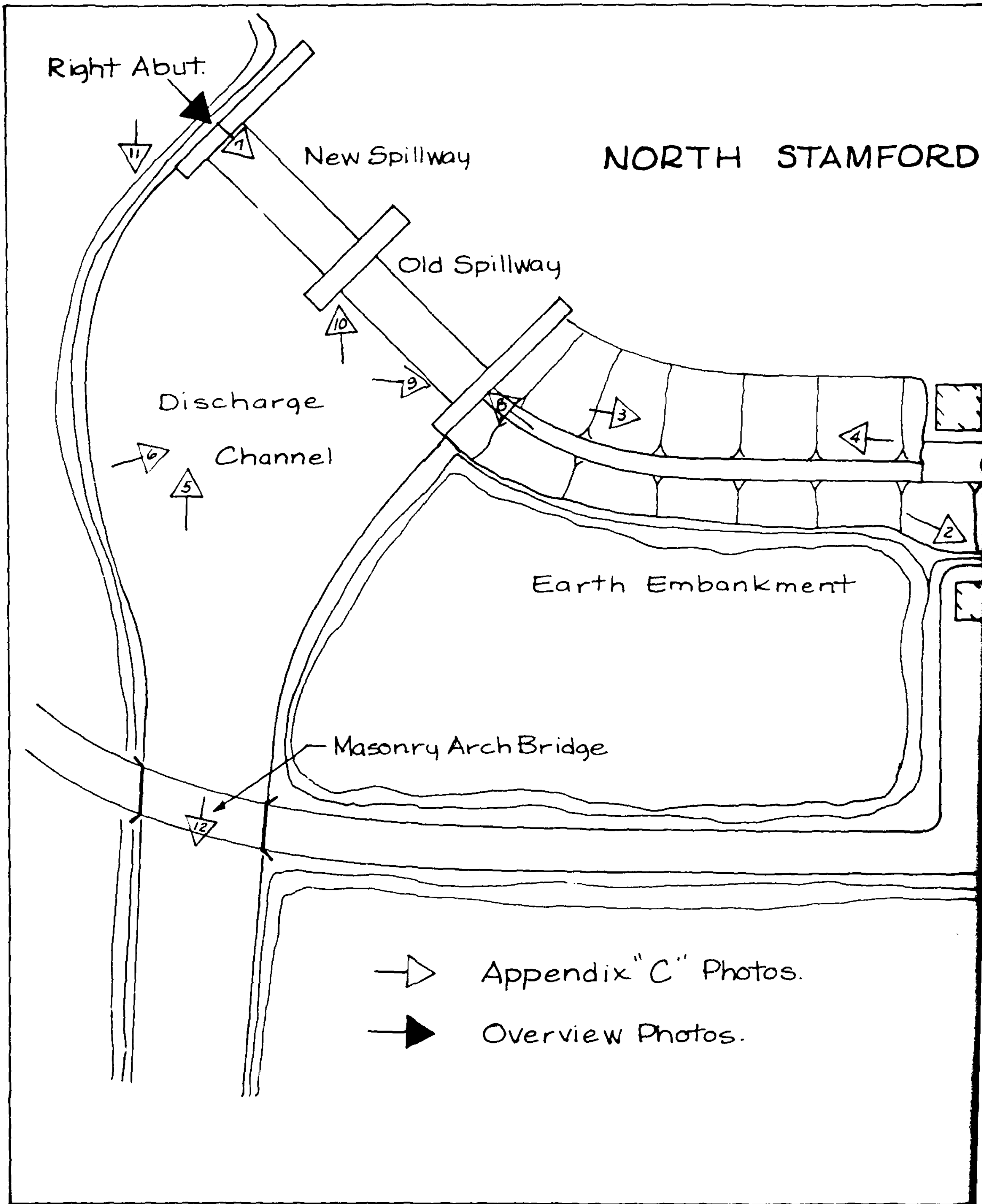


Lakeside Drive New Location
Present River Flow diverted to new Spillway
Stamford Water Company
Mill River Reservoir
North Stamford, Conn
General Plan
Scale 1"=50'
(except as noted)
August 20th 1908

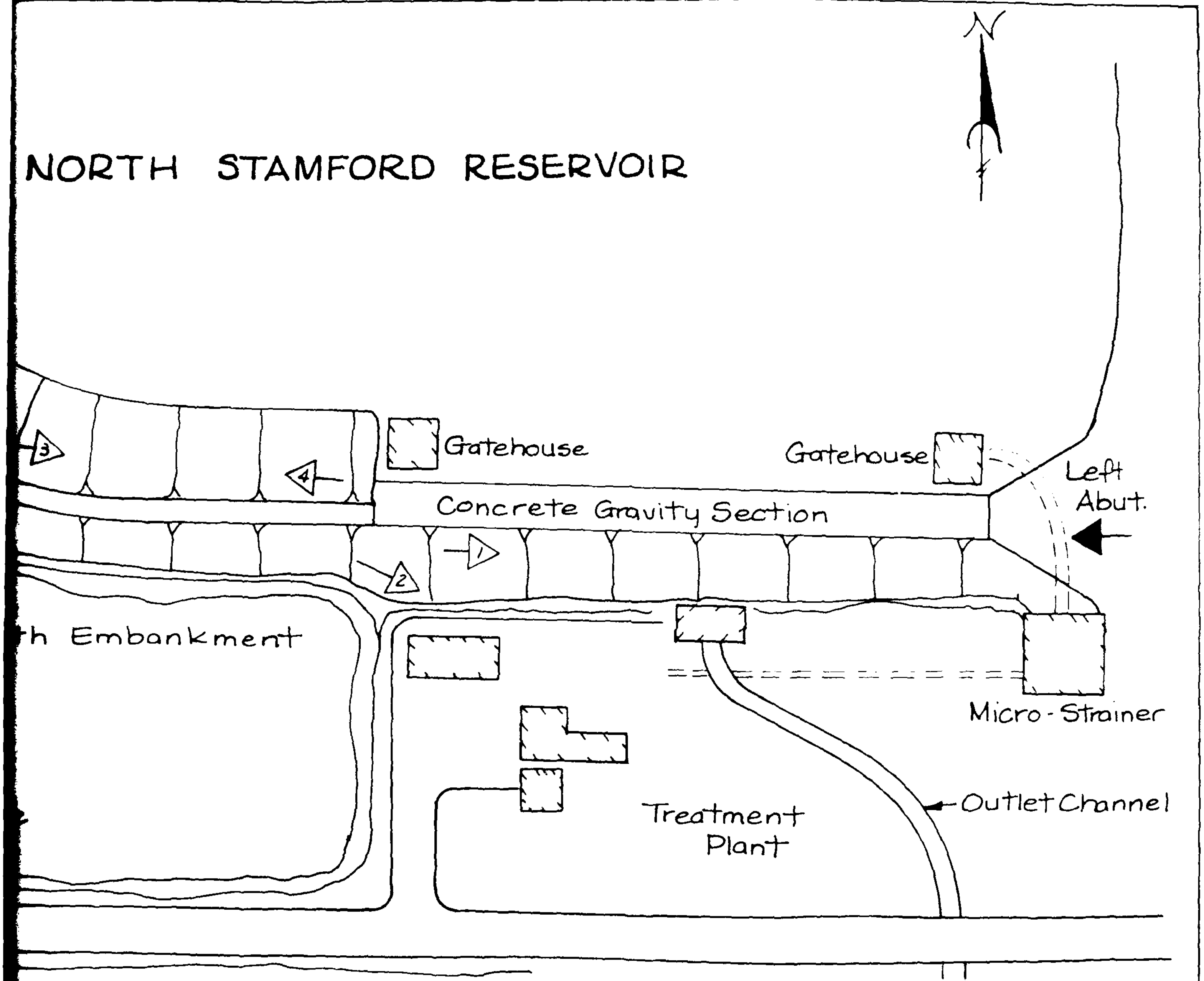
4

APPENDIX C

SELECTED PHOTOGRAPHS



Right Abut.
NORTH STAMFORD
New Spillway
Old Spillway
Discharge
Channel
Earth Embankment
Masonry Arch Bridge
1
2
3
4
5
6
7
8
9
10
11
12
Appendix "C" Photos.
Overview Photos.



ix" C" Photos.

w Photos.

LOUIS BERGER & ASSOC., INC
WELLESLEY, MASS.
ARCHITECT - ENGINEER

US ARMY ENGINEER DIV NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

N. STAMFORD RESERVOIR DAM

SKETCH PLAN SHOWING LOCATION & ORIENTATION OF PHOTOS

STATE - CT.

			SCALE 1:24000
			DATE

C-1 2

NORTH STAMFORD RESERVOIR DAM

1. Earth slope at downstream toe of concrete gravity dam section.

2. Toe of earth slope downstream from concrete gravity section, with outlet channel for 36 in. dia. blowoff.

3. Upstream slope of earth embankment section from midpoint looking towards left abutment.

4. Upstream slope of earth embankment section from midpoint looking towards right abutment.

5. New spillway section at right abutment.

6. Old spillway section to left of new section.

NORTH STAMFORD RESERVOIR DAM

7. New spillway section from right abutment.

8. Old spillway section from left end of spillways.

NORTH STAMFORD RESERVOIR DAM

9. Pool of water at downstream toe of old spillway section.

10. Left side of right wing wall to old spillway section, which is now divider between old and new sections.

11. Downstream channel from new spillway section, showing highway bridge.

12. Downstream channel from highway bridge.

APPENDIX D

HYDROLOGIC & HYDRAULIC COMPUTATIONS

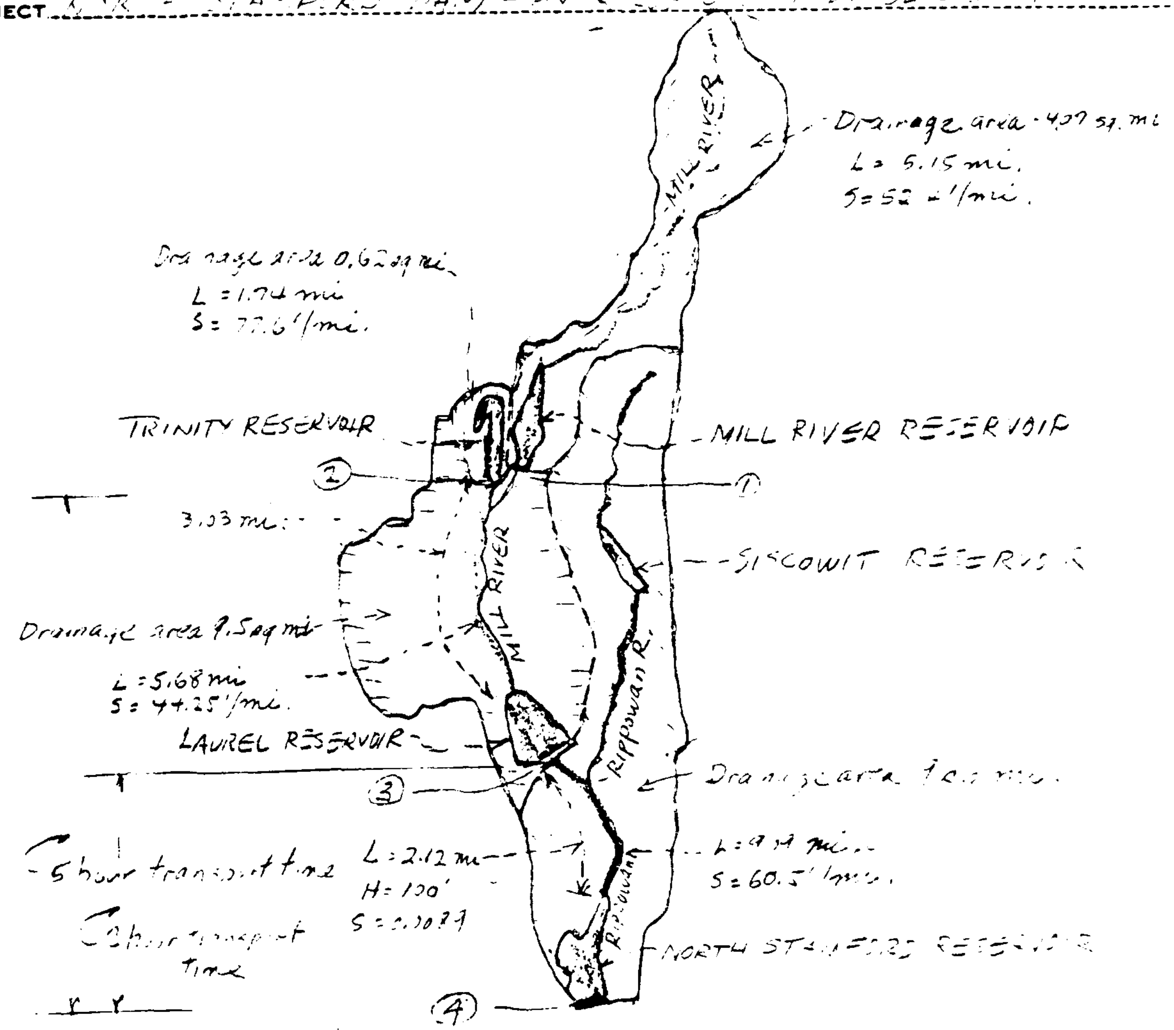
BY ______ DATE [illegible]

LOUIS BERGER & ASSOCIATES INC.

SHEET NO. D-1 OF __

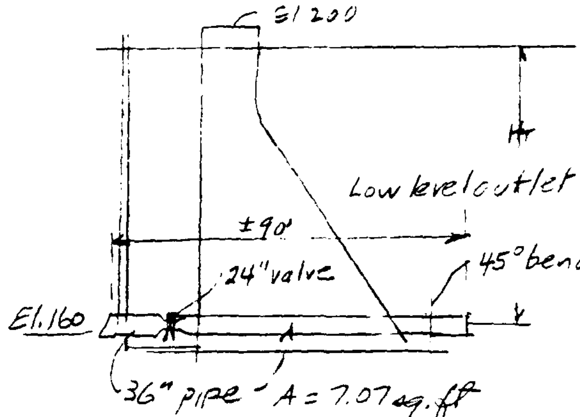
CHKD. BY ______ DATE ______ INSPECTION OF DAMS - CONN - R.I. PROJECT ______

SUBJECT NORTH STAMFORD DAM - HYDROLOGIC & HYDRAULIC DATA



RESERVOIR	LENGTH MI	WIDTH MI.	Normal W.S. USGS Datum	Normal Capacity A.F.	DRAINAGE AREA SQ.MI.	SURFACE AREA-ACRES
(5) NORTH STANFORD	1.2	0.2	201	571	[illegible]	109
(3) LAUREL	1.0	0.5	314	6930	9.5	259
(2) TRINITY	1.2	0.1	471	3719	0.62	125
(1) MILL	1.3	0.2	520	2501	4.07	[illegible]
SISCOWIT	0.9	0.1	448	307	—	—
					23.[illegible]	

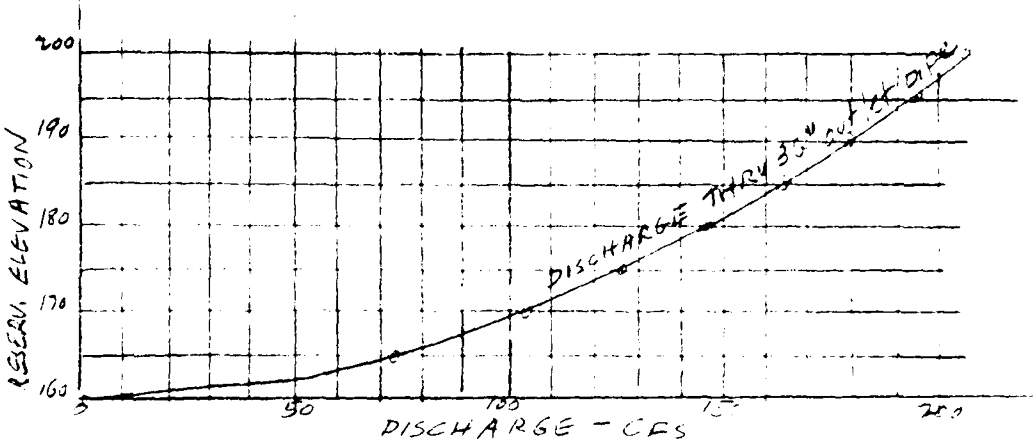
LOW LEVEL BYPASS OUTLET



Losses - Entrance 0.5 hv
Transitions + valve - 0.4 hv
45° Bend 0.2 hv
Friction $\frac{fL}{D}$: $\frac{.03 \times 90}{3.0}$ 0.9 hv
Exit 1.0 hv
Say Σk = 3.0 hv

$$Q = A\sqrt{\frac{2gH_T}{\Sigma k}} = 7.07\sqrt{\frac{64.4}{3}}\,H_T = 32.8\sqrt{H_T}$$

Res Elev.	H_T	Q	Vol. of outflow per. hr. A-F	Ave. Vol of outflow per hr.	Inc. Stor in. Res A-F	Evac. Time from Res (below 196) hrs	Evac. time From Res Ave. Inflow 10 cfs: Net. Ave outflow CFS	Ave. outflow Vol per hour	Evac. Time
200	40	207	17.1						
196	36	197	16.2						
195	35	194	16.0	16.1	112	7.0	185.5	15.3	7.3
190	30	179	14.8	15.4	498	32.3	176.5	14.6	34.1
185	25	164	13.5	14.15	408	28.8	161.5	13.3	30.7
180	20	146	12.0	12.75	276	21.6	145	12.0	23.0
175	15	127	10.5	11.25	169	15.0	126.5	10.4	16.3
170	10	103	8.5	9.5	82	8.6	105	8.7	9.4
165	5	73	6.0	7.25	25	3.5	78	6.4	3.9
						116.8 hrs			124.7



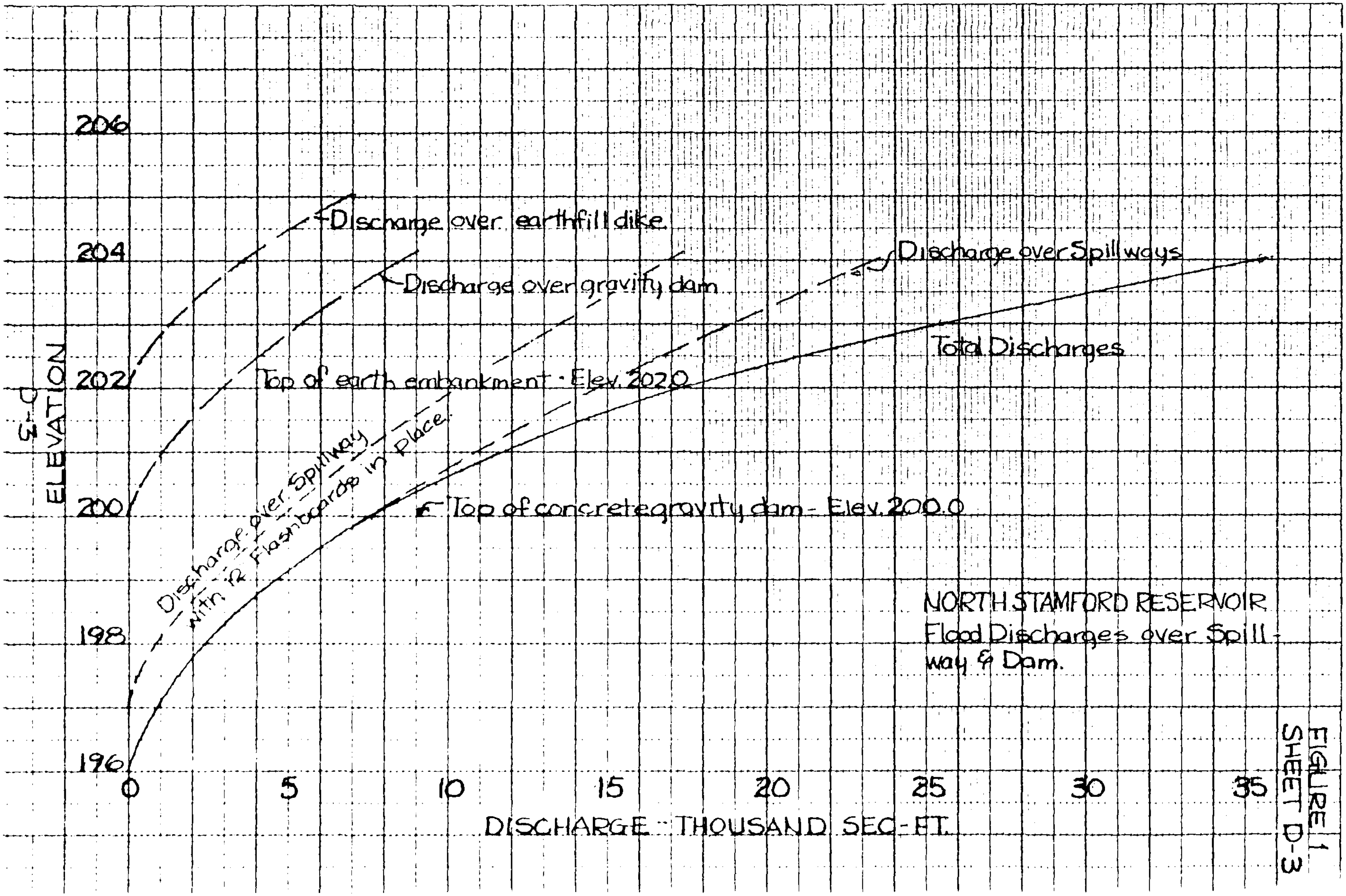


FIGURE 1
SHEET D-3

BY [illegible] DATE [illegible]

LOUIS BERGER & ASSOCIATES INC.

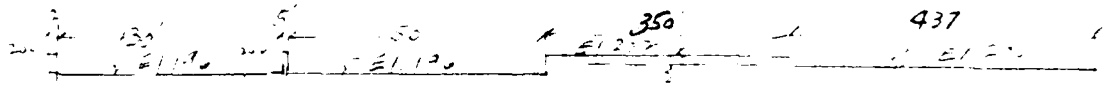
SHEET NO. D-4 OF

CHKD. BY ______ DATE ______ INSPECTION OF DAMS CONN - RI

PROJECT ______

SUBJECT North Stamford Dam - Discharge Curves

PROFILE ALONG DAM AND SPILLWAY



Spillway Section D   Spillway Sec. C   [illegible]   [illegible]

	Spillway Sec. D L=150				Overflow Sec. C L=30				[illegible]						
Elev	H	$\frac{H}{H_o}$	$\frac{C}{C_o}$	C	ΔQ	$\frac{H}{H_o}$	$\frac{C}{C_o}$	C	ΔQ	H	C	ΔQ	H	C	ΔQ	ΣQ
196	0				-											0
197	1	0.17	[illegible]	[illegible]	443	0.15	[illegible]	3.03	[illegible]							737
198	2	0.33	[illegible]	3.12	1324	[illegible]	[illegible]	[illegible]	[illegible]							[illegible]
199	3	[illegible]	[illegible]	[illegible]	2510	[illegible]	[illegible]	[illegible]	[illegible]							[illegible]
200	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0		0				[illegible]
201	5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1	2.8	[illegible]				[illegible]
202	6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2	2.85	2890		0		[illegible]
203	7	[illegible]	[illegible]	3.57	[illegible]	[illegible]	1.03	[illegible]	[illegible]	3	2.9	5403	1	[illegible]	1244	25401
204	8	1.33	[illegible]	3.64	[illegible]	1.44	[illegible]	3.70	[illegible]	4	2.95	8461	2	[illegible]	3579	35455
205	9	1.5	[illegible]	3.71	15026	[illegible]	[illegible]	[illegible]	[illegible]	5	3.0	12025	3	[illegible]	6991	47415

SPILLWAY ONLY   SPILLWAY AND ~~DAM~~

FOR NORTH STAMFORD DAM SPILLWAY

TRINITY [illegible] SPILLWAY

Drop inlet spillway crest   Effective width = [illegible]

Pipe flow [illegible]

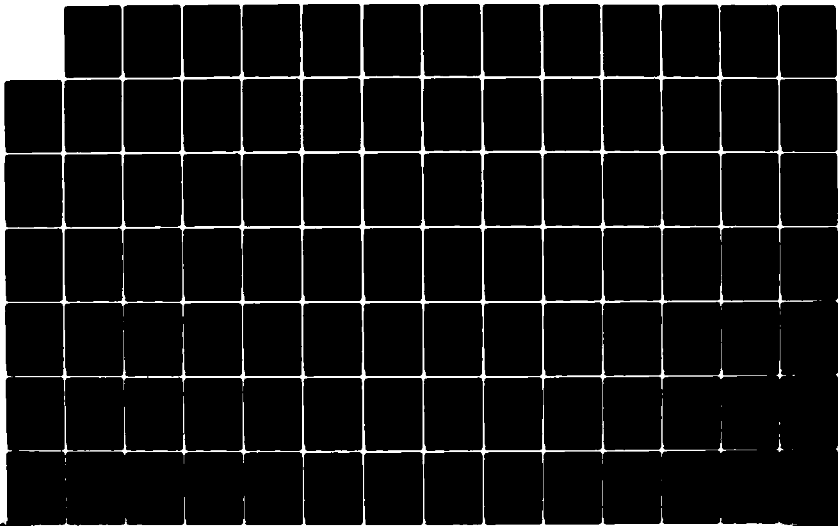
$Q = A \sqrt{\frac{2gH}{K}}$ [illegible]

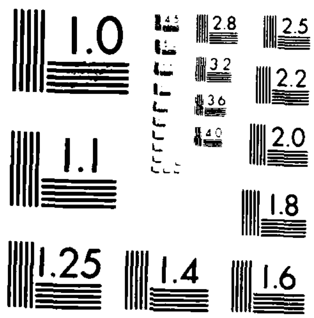
Elev	H	$\frac{H}{W}$	C	ΔQ	H_T	Pipe flow		Q
471	0			0	40			[illegible]
472	1	0.2	3.9	[illegible]	41			[illegible]
473	2	0.4	3.55	301	42	377	[illegible] = 3.55	301
474	3	0.6	3.10	453	43	382	H C ΔQ	382
475	4	0.8	2.45	555	44	[illegible]		386
476	5	1.0	2.05	658	45	391		391
477	6	1.2	1.70	750	[illegible]	395		[illegible]
478	7	1.4	1.45	811	47	399		[illegible]
[illegible]					48	[illegible]		[illegible]
[illegible]					49	[illegible]	[illegible]	[illegible]
[illegible]					50	[illegible]	[illegible]	[illegible]

AD-A142 763 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS NORTH STAMFORD RESERV..(U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV FEB 79

2/3

UNCLASSIFIED F/G 13/13 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

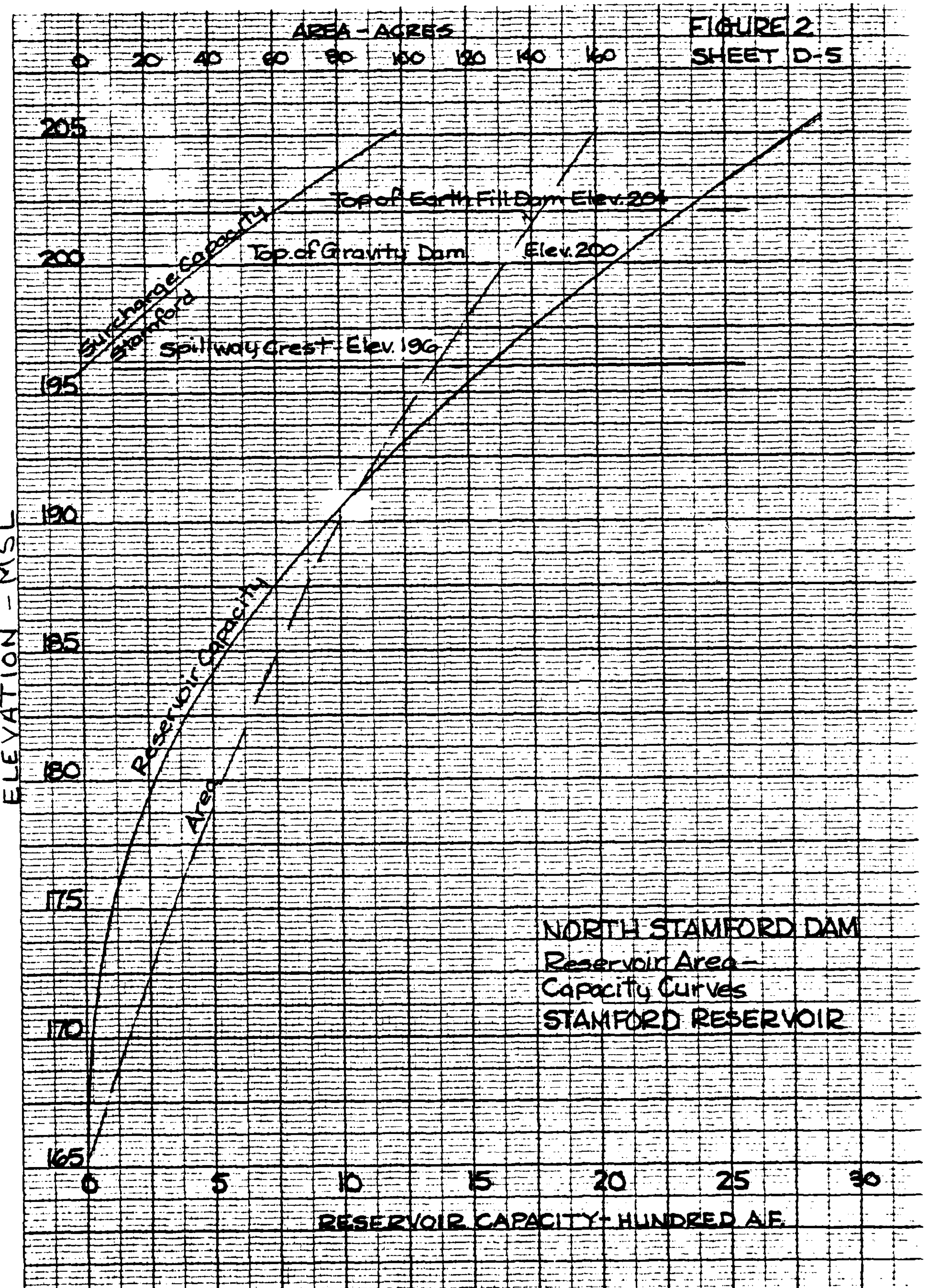


FIGURE 2
SHEET D-5
AREA - ACRES
0 20 40 60 80 100 120 140 160
205
200
195
190
185
180
175
170
165
ELEVATION - MSL
Top of Earth Fill Dam Elev. 204
Top of Gravity Dam
Elev. 200
Surcharge capacity Stamford
Spillway Crest - Elev. 196
Reservoir Capacity
Area
NORTH STAMFORD DAM
Reservoir Area -
Capacity Curves
STAMFORD RESERVOIR
0 5 10 15 20 25 30
RESERVOIR CAPACITY - HUNDRED A.F.

BY [illegible] DATE 10-23-78 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-6 OF

CHKD. BY DATE INSPECTION OF DAMS - CONN. & R.I. PROJECT

SUBJECT NORTH STAMFORD RESERVOIR DAM - AREA-CAPACITY

NORTH STAMFORD RESERVOIR

Elev.	Area	Ave Area	Δ	Reservoir Capacity AF	Surcharge Capacity
165	0			0	
175	[illegible]	10.7	107	107	
180		33.8	169	276	
185		55.2	276	552	
190		81.6	408	960	
191	123	96	96	1056	
192	83	103	103	1159	
193	115	99	99	1258	
194	85	100	100	1358	
195	115	100		1458	
196	111	113		1571	0
197	115	113		1684	113
198	120	118		1802	231
199	126	123		1931	354
200	132	129		2060	483
201	137	134		2194	617
202	143	140		2334	757
203	149	146		2480	903
204	154	152		2632	1055
205	160	157		2789	1212
206					

MILL RIVER RESERVOIR

Elev.	Area acres	Ave Area	Δ Stor	Σ Stor	Surcharge Stor
435	0				
440	0.7				
450	4.0				
460	9.2				
470	11.9				
480	22.2				
490	30.3				
500	37.6				
510	47.7				
520	63.3		2501	2501	0
521	66	64	64	2565	64
522	70	68	68	2633	132
523	73	72	72	2705	204
524	77	75	75	2780	279
525	82	80	80	2860	359
526	87	84	84	2944	443
527	94	90	90	3034	533
528	102	98	98	3132	631
529	114	108	108	3240	739
530	135	124	124	3364	863
531	160	147	147	3511	1010
532	180	170	170	3681	1180

Datum Equation 4'

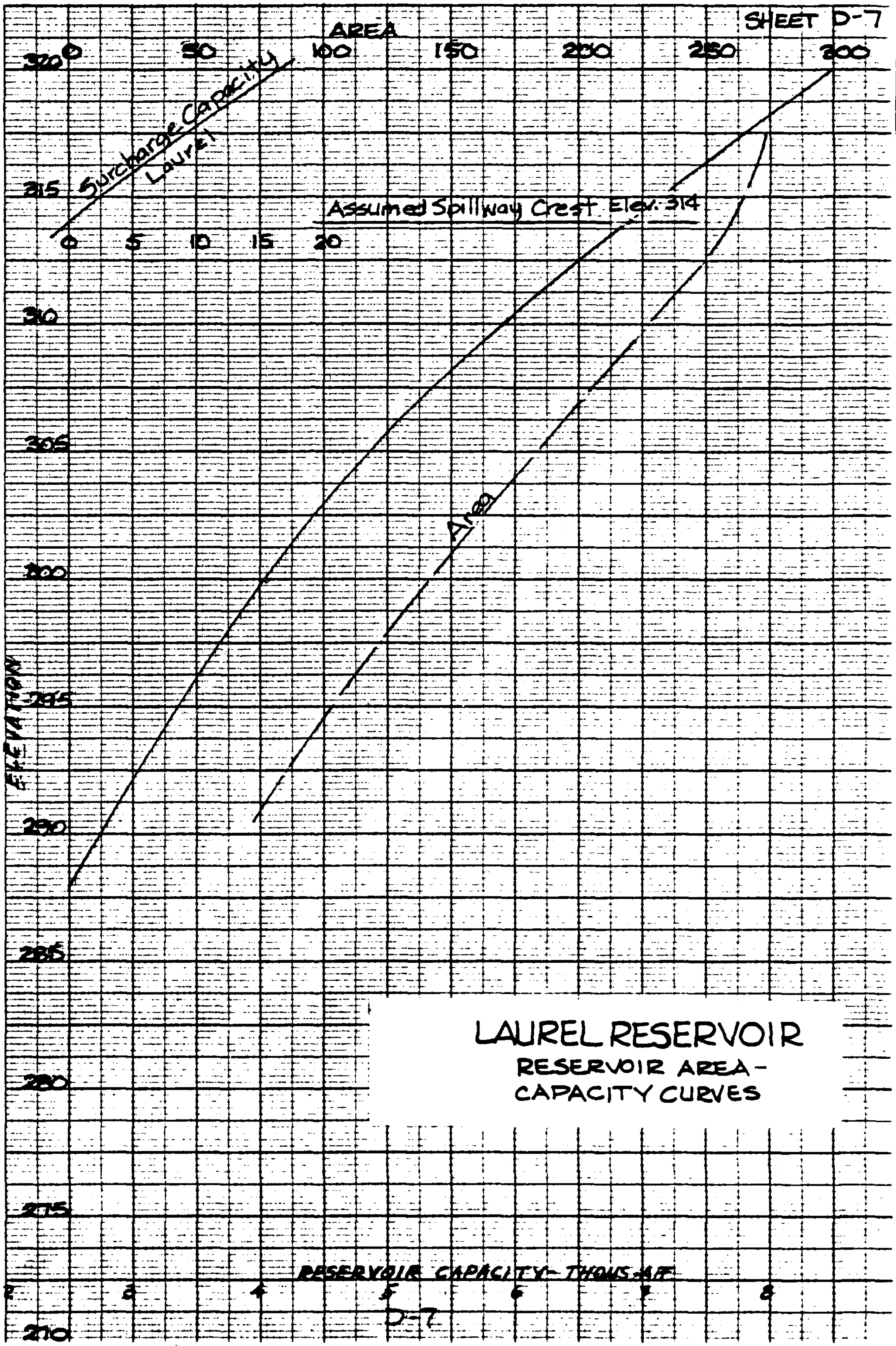
LAUREL RESERVOIR

Elev.	Area	Ave. Area	Δ	Reservoir Capacity Σ AF	Surcharge Capacity AF
270	0				
280	18	9.0	90	90	
290	68	43.0	430	520	
300	142	105	1050	1570	
310	227	184.5	1845	3415	
310 ~~314~~	259	243	972	4387 [illegible]	0
315	264	261.5	262	~~4649~~	262
316	268	266	266	4915	528
317	270	269	269	5184	797
318	275	272.5	273	5457	1070
319	278	276.5	277	5734	1347
320	281	279.5	280	6014	1627

TRINITY

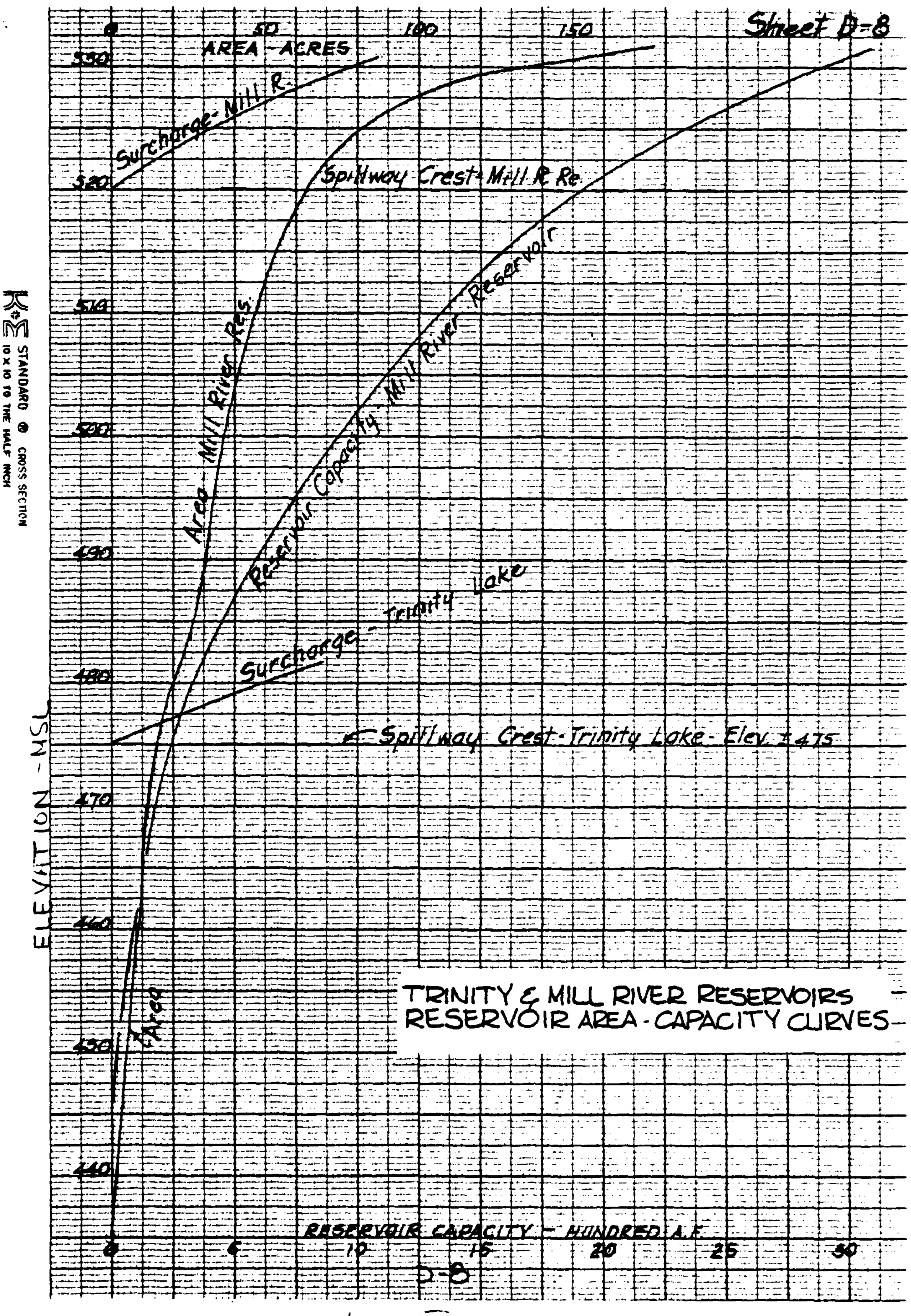
Elev	Area Acres	Average Area	Δ Storage	Σ Storage	Surcharge Stor
435	0	-			
471	124		3720		
472	125	124.5	125		125
473	125.5	125.25	125		250
474	126	125.75	126		376
475	126.5	126.25	126		502
476	127	126.75	127		630

D-6



LAUREL RESERVOIR

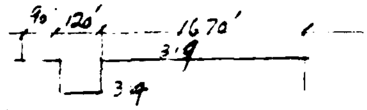
RESERVOIR AREA - CAPACITY CURVES


Sheet D-8
AREA - ACRES
0
50
100
150
530
520
510
500
490
480
470
460
450
440
Surcharge - Mill R.
Spillway Crest - Mill R. Re.
Area - Mill River Res.
Reservoir Capacity - Mill River Reservoir
Surcharge - Trinity Lake
Spillway Crest - Trinity Lake - Elev. ±475
Area
ELEVATION - MSL
TRINITY & MILL RIVER RESERVOIRS
RESERVOIR AREA - CAPACITY CURVES
RESERVOIR CAPACITY - HUNDRED A.F.
0
5
10
15
20
25
30
K+E STANDARD 10 X 10 TO THE HALF INCH CROSS SECTION

BY JR DATE 10/26/78 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-9 OF...

CHKD. BY .... DATE .... INSPECTION OF DAMS - CONN + RI. PROJECT ....

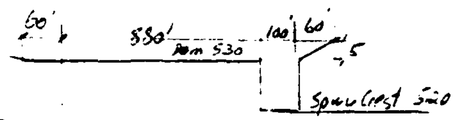
SUBJECT N. Stamford Dam - Upstream Reservoirs



Laurel Dam

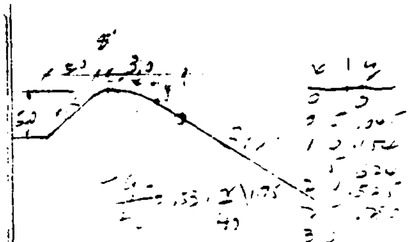
DISCHARGE CAPACITY $H_0 = 5'$

	Spillway L=130					Dam L=1760				
Elev	H	$\frac{H}{H_0}$	C/C_0	C	ΔQ	H	C	ΔQ	ΣQ	
314	0			-					0	Spillway crest
315	1	.20	.815	3.0	360				360	
316	2	.40	0.90	3.15	1069				1069	
317	3	.68	0.94	3.30	2058				2058	
318	4	.80	0.97	3.40	3264				3264	
319	5	1.0	1.00	3.5	4696	0			4696	Top of dam
320	6	1.2	1.03	3.6	6349	1	2.9	5104	11453	
321	7	1.4	1.05	3.68	8178	2	2.9	14436	22614	



Mill River Dam

	Spillway L=170					Dam			
Elev.	H	$\frac{H}{H_0}$	$\frac{C}{C_0}$	C	ΔQ	H	C	ΔQ	ΣQ
520									0
521	1	.02	.85	3.23	323				323
522	2	.04	0.9	3.42	967				967
523	3	.06	.94	3.57	1855				1855
524	4	0.8	0.97	3.67	2952				2952
525	5	1.0	1.0	3.5	4249				4249
526	6	1.2	1.025	3.90	5732				5732
527	7	1.4	1.05	4.00	7408				7408
528	8	1.6	1.07	4.07	9209				9209
529	9	1.8	-	4.1	11070				11070
530	10	2.0	-	4.1	12965				12965
531	11	2.2	-	4.1	14958	1	2.9	2726	17684
532	12	2.4	-	4.1	17043	2	2.0	7874	24917



$H_0 = 3.37$

$H_0 = 5.00$

BY CJH DATE 1-29-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-10 OF

CHKD. BY ______ DATE ______ INSPECTION OF DAMS - CONN & R.I. PROJECT ______

SUBJECT NORTH STAMFORD DAM - HYDROLOGY

SOUTHWESTERN CONNECTICUT. FROM HYDRO #33

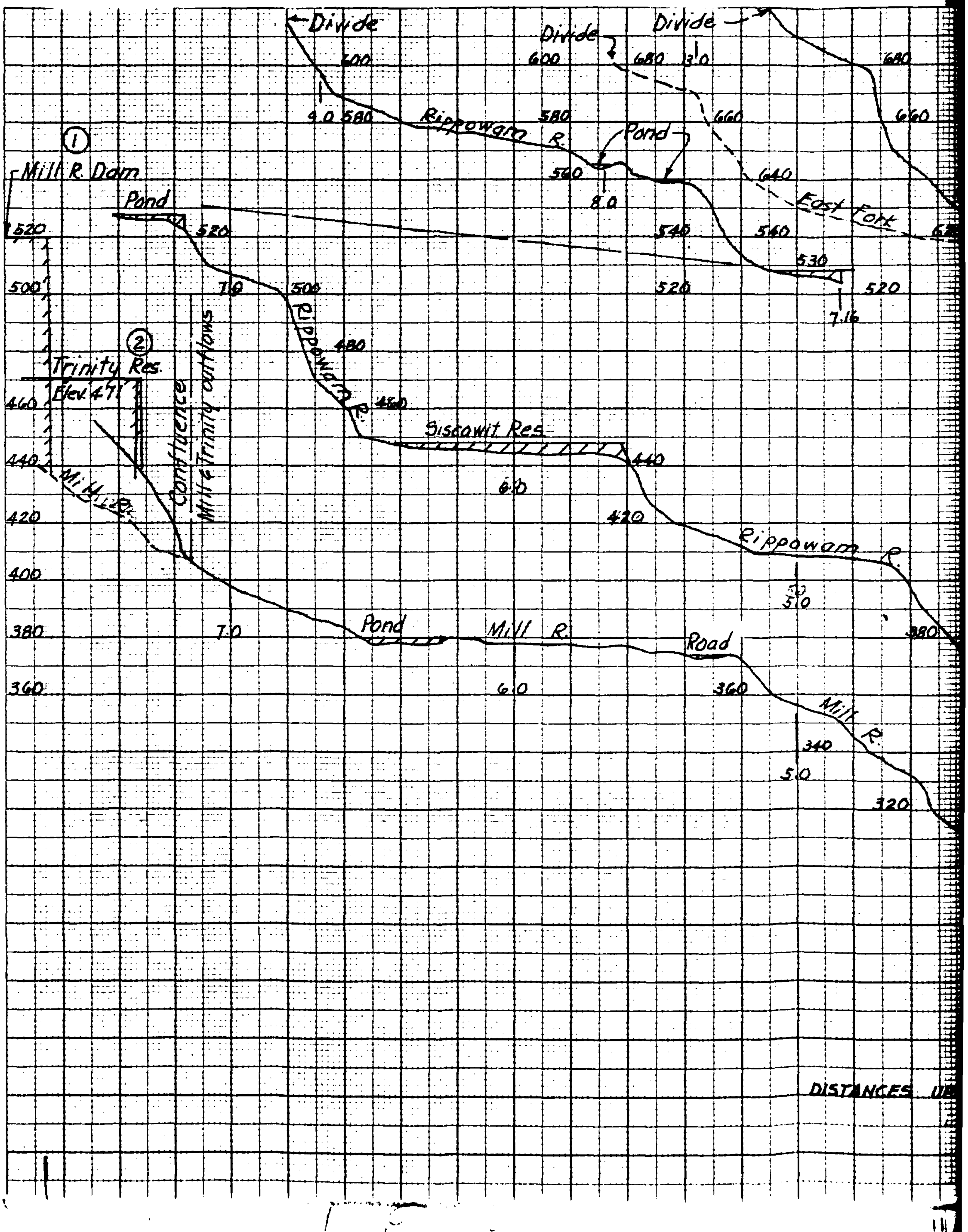
6 hr. RAINFALL FOR 10 sq. mi area = 24.5 inches

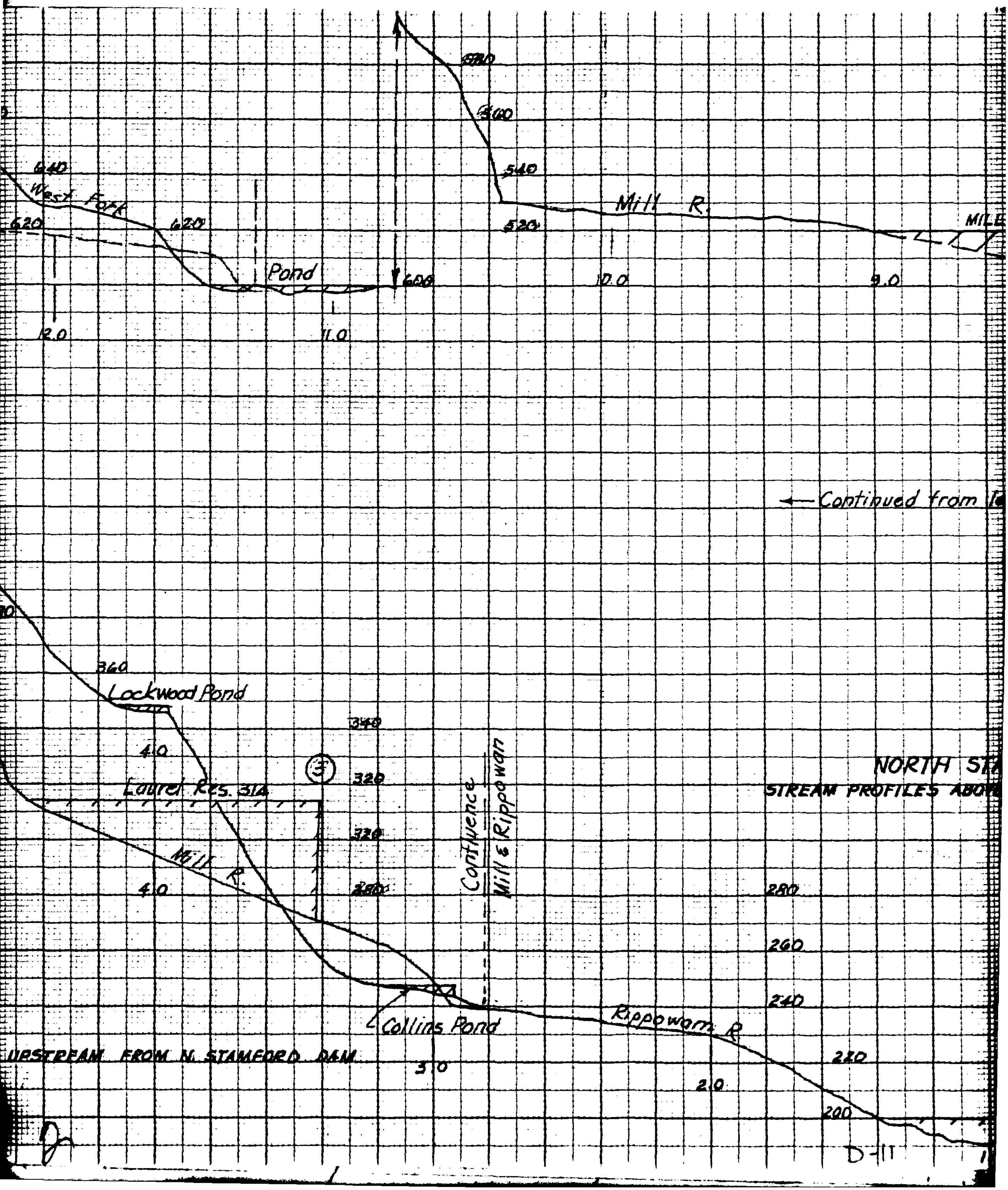
Reduction fit factor for 23.2 sq mi = 19%

% of 10 sq. mi for 23.2 sq. mi. = 91%

∴ total adjusted rainfall = .81 × .91 = .735 × 24.5 = 18"

Time 0.5 hrs	Rearranged % of 6 hr rainfall	Δ Precipitation inches	Infiltration Loss - in.	Rainfall excess - inches
0.5	5.0	0.90	0.5	0.40
1.0	5.0	0.90	0.5	0.40
1.5	5.5	0.99	0.1	0.89
2.0	6.5	1.17	0.1	1.07
2.5	7.0	1.26	0.1	1.16
3.0	8.0	1.44	0.1	1.34
3.5	10.0	1.80	0.1	1.70
4.0	28.0	5.04	0.1	4.94
4.5	7.0	1.26	0.1	1.16
5.0	7.0	1.26	0.1	1.16
5.5	6.0	1.08	0.1	0.98
6.0	5.0	0.90	0.1	0.98
		18.00	2.0	16.00


Divide
Divide
Divide
600
600
680
660
680
660
9.0 580
580
Rippowam R.
Pond
560
8.0
640
East Fork
1
Mill R. Dam
Pond
520
520
540
560
530
500
7.0
500
520
520
7.16
Rippowam R.
480
2
Trinity Res.
Elev. 471
460
460
Confluence
Mill & Trinity outflows
Siscowit Res.
440
440
Mi Hill Br.
6.0
420
420
Rippowam R.
400
5.0
380
7.0
Pond
Mill R.
Road
380
360
6.0
360
Mill R.
340
5.0
320
DISTANCES IN


640
West Fork
620
620
Pond
600
12.0
11.0
580
560
540
Mill R.
520
10.0
9.0
MILE
← Continued from Te
360
Lockwood Pond
340
4.0
320
Laurel Res. 31A
320
Mill R.
4.0
280
Confluence
Mill & Rippowam
NORTH ST
STREAM PROFILES ABOV
280
260
240
Collins Pond
Rippowam R.
UPSTREAM FROM N. STAMFORD DAM
3.0
2.0
220
200
D-11

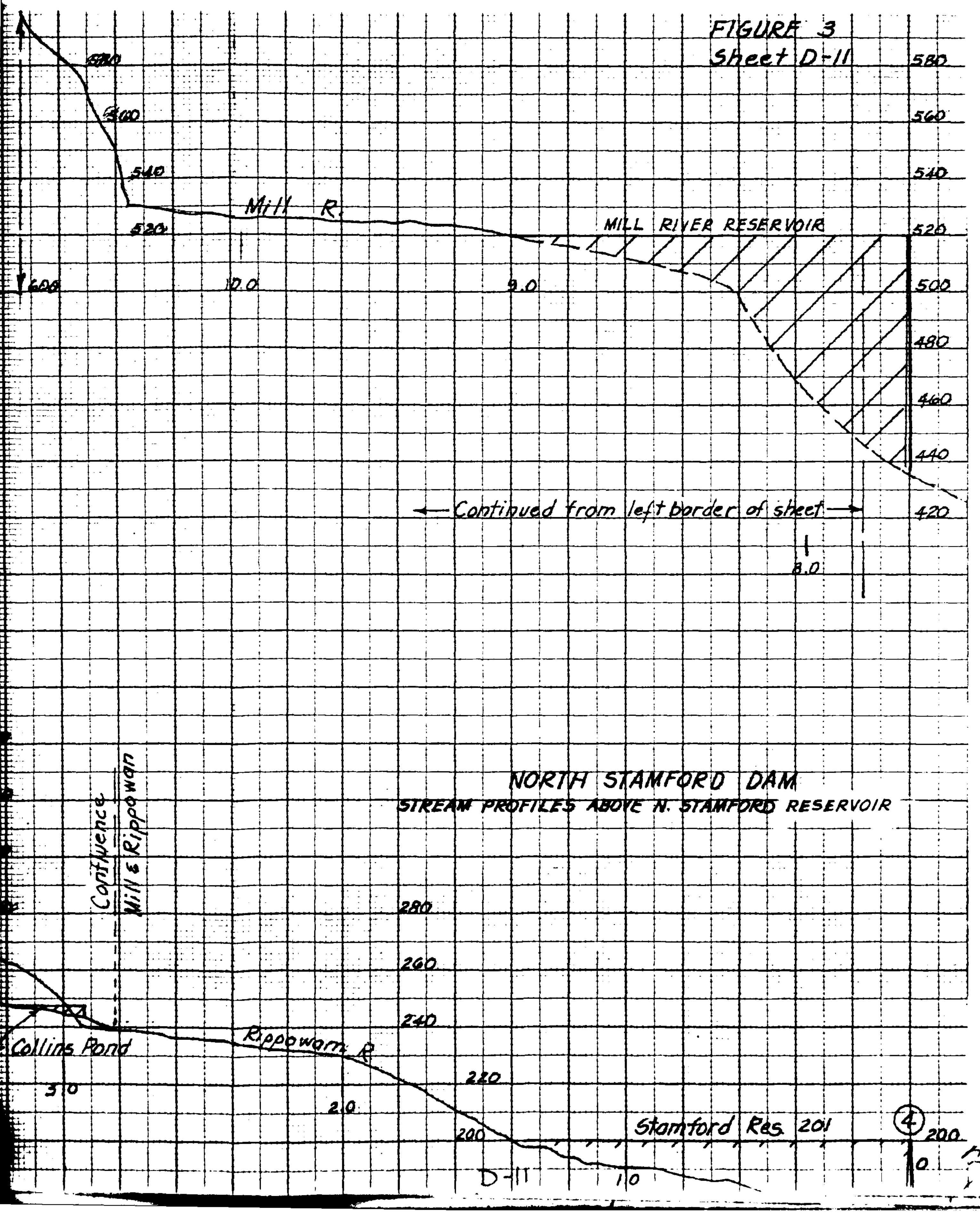


FIGURE 3
Sheet D-11
580
560
540
520
500
480
460
440
420
Mill R.
MILL RIVER RESERVOIR
600
10.0
9.0
8.0
← Continued from left border of sheet →
NORTH STAMFORD DAM
STREAM PROFILES ABOVE N. STAMFORD RESERVOIR
Confluence
Mill & Rippowan
280
260
240
220
200
Collins Pond
Rippowam R.
3.0
2.0
1.0
Stamford Res. 201
200
0
4
D-11

LOUIS BERGER & ASSOCIATES INC.

BY: GJH DATE: 1-31-79 SHEET NO. D-12 OF
CHKD. BY: DATE: INSPECTION OF DAMS - CONN + R.I. PROJECT:
SUBJECT: NORTH STAMFORD DAM - HYDROLOGY

$Lag = K\left(\frac{L \times \frac{L}{2}}{\sqrt{S}}\right)^{.33}$ $T_p = 0.75\,Lag + .375D$ $T_c = 1.67T_p - 3.83D$

REACH	Sta. Point	Longest stream length - mi Sub.	Total	Stream slope Ft/mi Sub	Total	Lag - hrs Curve B K=3.75 Sub	Total	Computed Unit graph Time to peak T_p D = 1.0 hrs	Adopted T_p hrs	T_c hrs	Ave Velocity Ft/sec	Transport time From - to	Miles	Ave. velocity Ft/sec	Time hrs
Above Mill River	El. 630	0.6		83.3		1.00									
Dam	El. 610	1.3		15.4		2.25									
DA. 4.07 sq mi	El. 600	0.7		14.3		1.50									
Above (1)	El. 530	0.35		200		0.62									
	Mill Res. Sta	1.4		7.1		2.70	8.02	6.42							
			4.35		25.3		4.61	3.83	6.0	10	0.64	-	-	-	-
Above Trinity Dam - Above (2) DA = 0.62 sq mi		0.35	0.35		297		0.58	0.81	1.0	0.85	0.60	-	-	-	-
Between Laurel	El. 380	1.10		54.5		1.64						(1) and (2) to (3)			
and Mill + Trinity	370	1.35		7.4		2.61									
Between (1)(2) and (3)	Laurel 314	0.75		74.7		1.21	5.46	4.47							
DA = 9.5 sq mi			3.20		39.4		3.50	3.0	4.0	6.7	0.70		3.20	1.56	3.0
Between N. Stamford	N.S. 590	0.15		166.7		0.37						Laurel Res. to North Stamford			
and Laurel	560	1.25		24.0		2.04									
Between (3) and (4)	530	0.28		107.1		0.60									
DA - 9.0 sq mi	500	0.60		50.0		1.12									
	450	0.28		178.6		0.55									
	440	0.95		10.5		1.96									
	410	0.95		36.8		1.60									
	340	0.70		84.3		1.13									
	250	0.65		147.[illegible]		[illegible]									
	201	1.10		25.0		2.07	13.02	10.14	8.0						
			[illegible]		63.7		[illegible]	4.83		12.5	0.90		3.0	1.47	[illegible]

weighted mean velocity = 0.78'/sec

weighted mean velocity = 1.5'/sec

BY: [illegible] DATE: 1-31-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-13 OF

CHKD. BY: DATE: INSPECTION OF DAMS - CONN. & R.I. PROJECT:

SUBJECT: NORTH STAMFORD DAM - HYDROLOGY

CURVILINEAR UNITGRAPHS

(B) $Q_p = \frac{484 \times 9.5}{4.0} = 1149.5$

(C) $Q_p = \frac{484 \times 4.07}{6} = 328.3$

Time HRS	$T_p = 1.0$ T/T_p	Q/Q_p	(A) $Q_p = 300$ Q	$T_p = 4.0$ T/T_p	Q/Q_p	(B) $Q_p = 1149.5$ Q	$T_p = 6.0$ T/T_p	Q/Q_p	(C) $Q_p = 328.3$ Q	$T_p = 8$ T/T_p	Q/Q_p	$Q_p =$ [illegible] Q
0.5	0.5	0.43	129	0.125	0.030	34	0.083	0.0125	4	0.0625	.0092	5
1.0	1.0	1.00	300	0.25	0.1175	135	0.167	0.053	17	0.125	.029	16
1.5	1.5	0.66	198	0.375	0.250	287	0.25	0.1175	39	0.1875	.0645	35
2.0	2.0	0.32	96	0.50	0.43	494	0.333	0.200	66	0.25	.1175	64
2.5	2.5	0.155	47	0.625	0.642	738	0.417	0.305	100	0.3125	.175	95
3.0	3.0	0.075	23	0.75	0.83	954	0.50	0.43	141	0.3875	.259	141
3.5	3.5	0.036	11	0.875	0.95	1092	0.583	0.578	190	0.4375	.329	179
4.0	4.0	0.018	5	1.00	1.00	1150	0.667	0.714	234	0.50	.43	234
4.5	4.5	0.009	3	1.125	0.965	1109	0.75	0.77	253	0.5625	.536	292
5.0	5.0	0.004	1	1.25	0.89	1012	0.833	0.920	302	0.625	[illegible]	350
5.5	5.5			1.375	0.772	887	0.917	0.975	320	0.6875	[illegible]	[illegible]
6.0	6.0			1.50	0.66	759	1.00	1.00	328	0.75	.83	452
6.5	6.5			1.625	0.542	623	1.083	0.983	323	0.8125	.90	[illegible]
7.0	7.0			1.75	0.455	523	1.167	0.940	309	0.875	.942	513
7.5	7.5			1.875	0.382	439	1.25	0.880	289	0.9375	.982	535
8.0	8.0			2.00	0.32	368	1.333	0.807	265	1.00	1.00	[illegible]
8.5				2.125	0.27	310	1.417	[illegible]	241	1.0625	.986	537
9.0				2.25	0.225	259	1.50	[illegible]	217	1.125	[illegible]	520
9.5				2.375	0.188	216	1.583	0.575	189	1.1875	[illegible]	505
10.0				2.50	0.155	178	1.67	0.515	169	1.25	[illegible]	[illegible]
10.5				2.625	0.126	145	1.75	0.455	149	1.3125	[illegible]	[illegible]
11.0				2.75	0.106	122	1.833	[illegible]	132	1.3875	[illegible]	[illegible]
11.5				2.875	0.0894	103	1.917	0.361	119	1.4375	[illegible]	390
12.0				3.00	0.075	86	2.00	0.32	105	1.50	.66	357
12.5				3.125	0.0653	75	2.083	0.286	94	1.5625	.578	326
13.0				3.25	0.0555	64	2.167	0.254	83	1.625	.544	296
13.5				3.375	0.0458	53	2.25	0.225	74	1.6875	[illegible]	272
14.0				3.50	0.036	41	2.333	0.200	[illegible]	1.75	.455	248
14.5				3.625	0.0315	36	2.417	0.1758	58	1.8125	[illegible]	[illegible]
15.0				3.75	0.027	31	2.50	0.155	51	1.875	.383	[illegible]
15.5				3.875	0.0225	26	2.583	0.1342	44	1.9375	[illegible]	[illegible]
16.0				4.00	0.018	21	2.667	0.1193	39	2.00	.32	174
16.5				4.125	0.0153	18	2.75	0.1060	35	2.0625	.295	161
17.0				4.25	0.0135	16	2.833	0.0942	31	2.125	.27	[illegible]
17.5				4.375	0.0112	13	2.917	0.0846	28	2.1875	.245	133
18.0				4.50	0.009	10	3.00	0.075	25	2.25	.225	123

Above Trinity Dam D.A. = 0.62 sq mi

Qp for unit runoff = $\frac{484 \times 0.62}{1.0}$ = 300

BY: [illegible] DATE: 1-31-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-14 OF

CHKD. BY: DATE: INSPECTION OF DAMS - CONN. + R.I. PROJECT:

SUBJECT: NORTH STAMFORD DAM - HYDROLOGY

Sheet D-13 Continued

Time	Tp = 1.0 T/Tp	Q/Qp	Qp = 300 Q	Tp = 4.0 T/Tp	Q/Qp	Qp = 1149.5 Q	Tp = 6.0 T/Tp	Q/Qp	Qp = Q	Tp = 8.0 T/Tp		
18.5				4.625	.0078	9	3.083	.0683	22	2.3125	.206	112
19.0				4.75	.0065	8	3.167	.0620	20	2.3875	.186	10[illegible]
19.5				4.875	.0052	6	3.25	.0555	18	2.4375	.171	93
20.0				5.00	.004	5	3.333	.0490	16	2.50	.155	84
20.5							3.417	.0424	14	2.5625	.1381	75
21.0							3.50	.036	12	2.625	.1264	69
21.5							3.583	.033	11	2.6875	.116	63
22.0							3.667	.0301	10	2.75	.106	58
22.5							3.75	.027	9	2.8125	.0966	53
23.0							3.833	.024	8	2.875	.0891	49
23.5							3.917	.0212	7	2.9375	.0822	45
24.0							4.00	.018	6	3.00	.075	41
24.5							4.083	.0165	5	3.0625	.0701	38
25.0							4.167	.015	5	3.125	.0654	36
25.5							4.25	.0135	4	3.1875	.0604	33
26.0							4.333	.012	4	3.25	.0555	30
26.5							4.417	.0105	3	3.3125	.0502	27
27.0							4.50	.009	3	3.375	.0448	24
27.5							4.583	.0082	3	3.4375	.0409	22
28.0							4.667	.0074	2	3.50	.036	20
28.5							4.75	.0065	2	3.5625	.0337	18
29.0							4.833	.0057	2	3.625	.0316	17
29.5							4.917	.0048	2	3.6875	.0293	16
30.0							5.00	.004	1	3.75	.027	15
30.5										3.8125	.0247	13
31.0										3.875	.0224	12
31.5										3.9375	.0204	11
32.0										4.00	.018	10

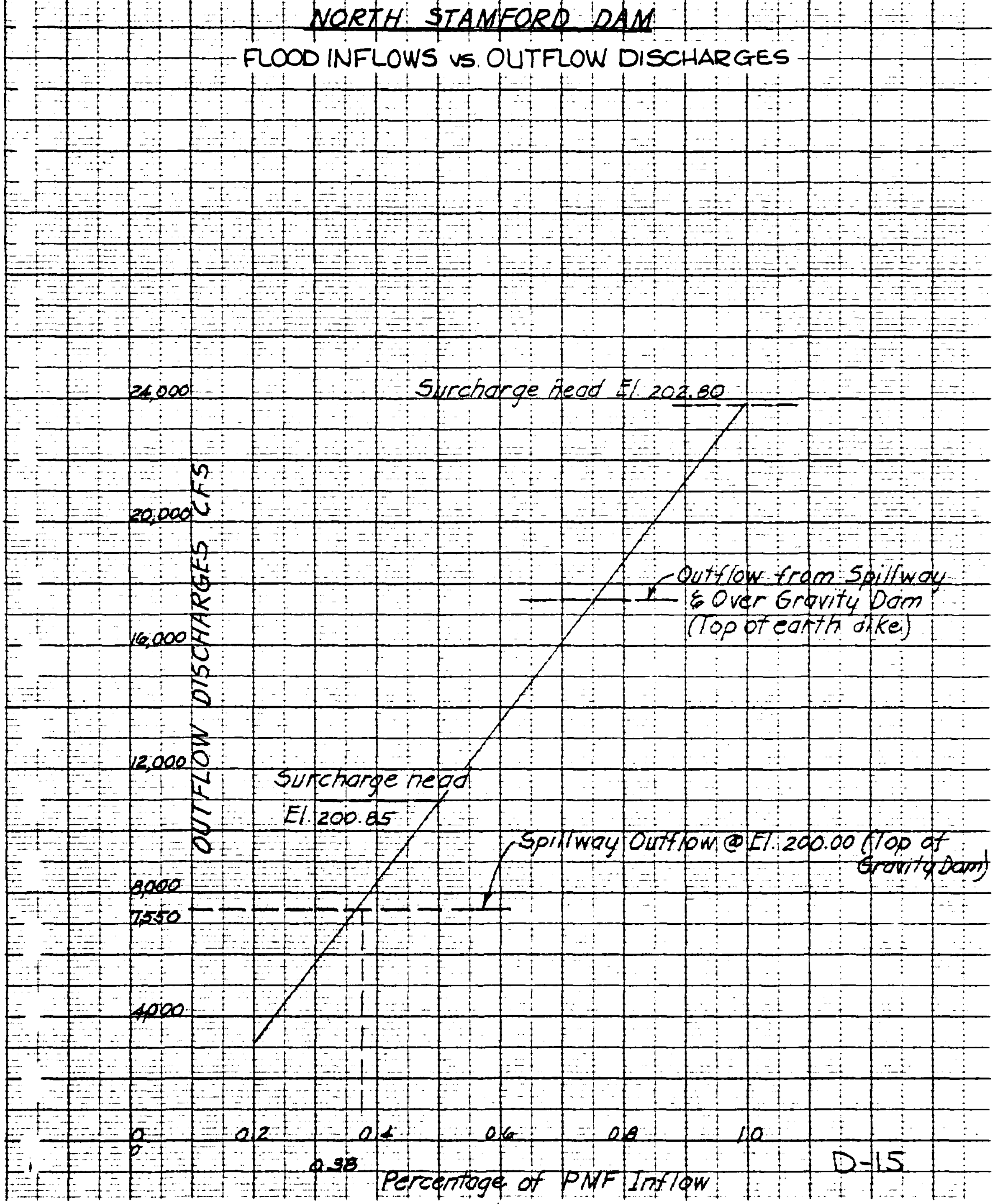
Between Laurel & Mill, Trinity Reservoir DA: 9.5 sq mi

Q_p/1 inch runoff = $\frac{484 \times 9.5}{4} = 1149.5$

Above Mill River Dam
DA = 4.07 sq mi
Q_p/inch runoff = $\frac{484 \times 4.07}{6} = 328.3$

N Stamford Dam to Laurel [illegible]
DA = 9.0 [illegible] 484 [illegible]

FIGURE 3
Sheet D-15



BY: _[illegible]_ DATE: 2-12-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-16 OF __

CHKD. BY ______ DATE ______ PROJECT ______

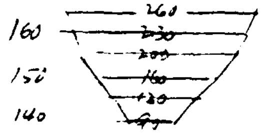
SUBJECT: NORTH STAMFORD DAM - DAM FAILURE ANALYSIS - HYDRAULICS

GRAVITY DAM FAILURE - Length of dam 350'
length at mid height 250' - @ 40% = 100'

For 100' breach failure $Q_{pi} = \frac{8}{27} w \sqrt{g}\, y^{3/2}$ $y = 40'$
$Q_{pi} = 1.68\, w\, y^{3/2} = 42,500$ cfs

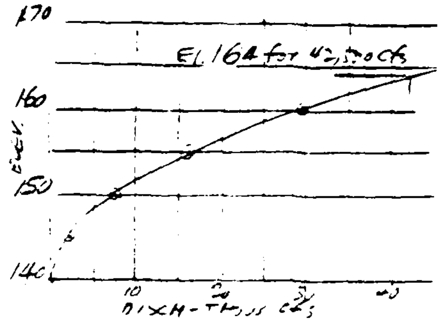
Stage discharge @ points below dam

@ Riverbed El. 140 (4900' below dam) $S = \frac{10}{1500} = .0067$ $S^{1/2} = .082$
$n = 0.075$

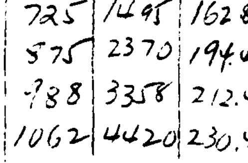


$Q = \frac{1.486}{.075} A r^{2/3} S^{1/2} = 1.62 A r^{2/3}$

Elev.	width	Δ Area	Σ area	w.p.	r	$r^{2/3}$	Q
140	90	-	0				
145	120	525	525	121.6	4.32	2.65	2254
150	160	700	1225	162.8	7.52	3.84	7620
155	200	900	2125	204.0	10.42	4.77	16420
160	230	1075	3200	235.6	13.55	5.69	29511
165	260	1225	4425	267.2	16.56	6.50	46570

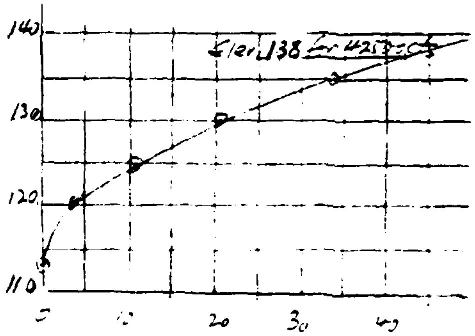


@ Riverbed El. 113 (9500' below dam) $S = \frac{10}{1500} = .0067$ $S^{1/2} = .082$
$n = .075$



$Q = 1.62 A r^{2/3}$

Elev.	Width	Δ Area	Σ Area	w.p.	r	$r^{2/3}$	Q
113	90		0				
120	130	770	770	131.2	5.86	3.25	4059
125	160	725	1495	162.8	9.18	4.39	10627
130	190	875	2370	194.4	12.19	5.30	20350
135	205	988	3358	212.4	15.81	6.30	34296
140	220	1062	4420	230.4	19.18	7.17	51364



Valley storage
Dam to Sta 40+00 $Vol = \frac{4200 \times 4000}{43560} = 386$ AF
Sta 40+00 to 95+00 $Vol = \frac{5500 \times 4200}{43560} = \underline{530}$
916 AF

BY QMA DATE 2-12-79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. D-16 OF

CHKD. BY ______ DATE ______ PROJECT ______

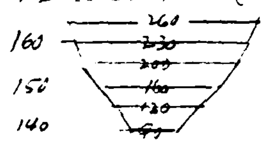
SUBJECT NORTH STAMFORD DAM - DAM FAILURE ANALYSIS - HYDRAULICS

GRAVITY DAM FAILURE - length of dam 350'
length at mid height 250' - @ 40% = 100'

For 100' breach failure $Q_{pi} = \frac{8}{27} w \sqrt{g}\, y^{3/2}$ $y = 40'$
$Q_{pi} = 1.68\, w\, y^{3/2} = 42{,}500$ cfs

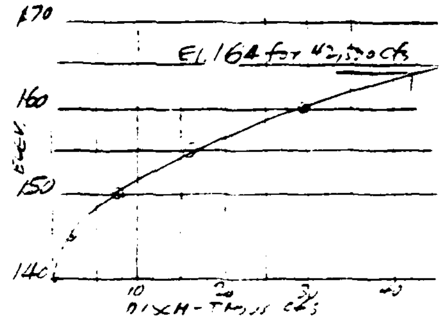
Stage discharge @ points below dam

@ Riverbed El. 190 (4000' below dam) $S = \frac{10}{1500} = .0067$ $S^{1/2} = .082$
$n = 0.075$

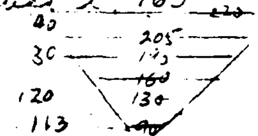


$Q = \frac{1.486}{.075} A r^{2/3} S^{1/2} = 1.62 A r^{2/3}$

Elev.	width	Δ Area	Σ area	w.p.	r	$r^{2/3}$	Q
140	90	-	0				
145	120	525	525	121.6	4.32	2.65	2254
150	160	700	1225	162.8	7.52	3.84	7620
155	200	900	2125	204.0	10.42	4.77	15420
160	230	1075	3200	235.6	13.55	5.69	29511
165	260	1225	4425	267.2	16.56	6.50	43570

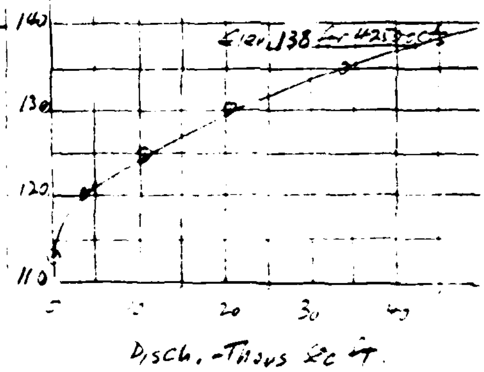


@ Riverbed El. 163 (9500' below dam) $S = \frac{10}{1500} = .0067$ $S^{1/2} = .082$
$n = .075$

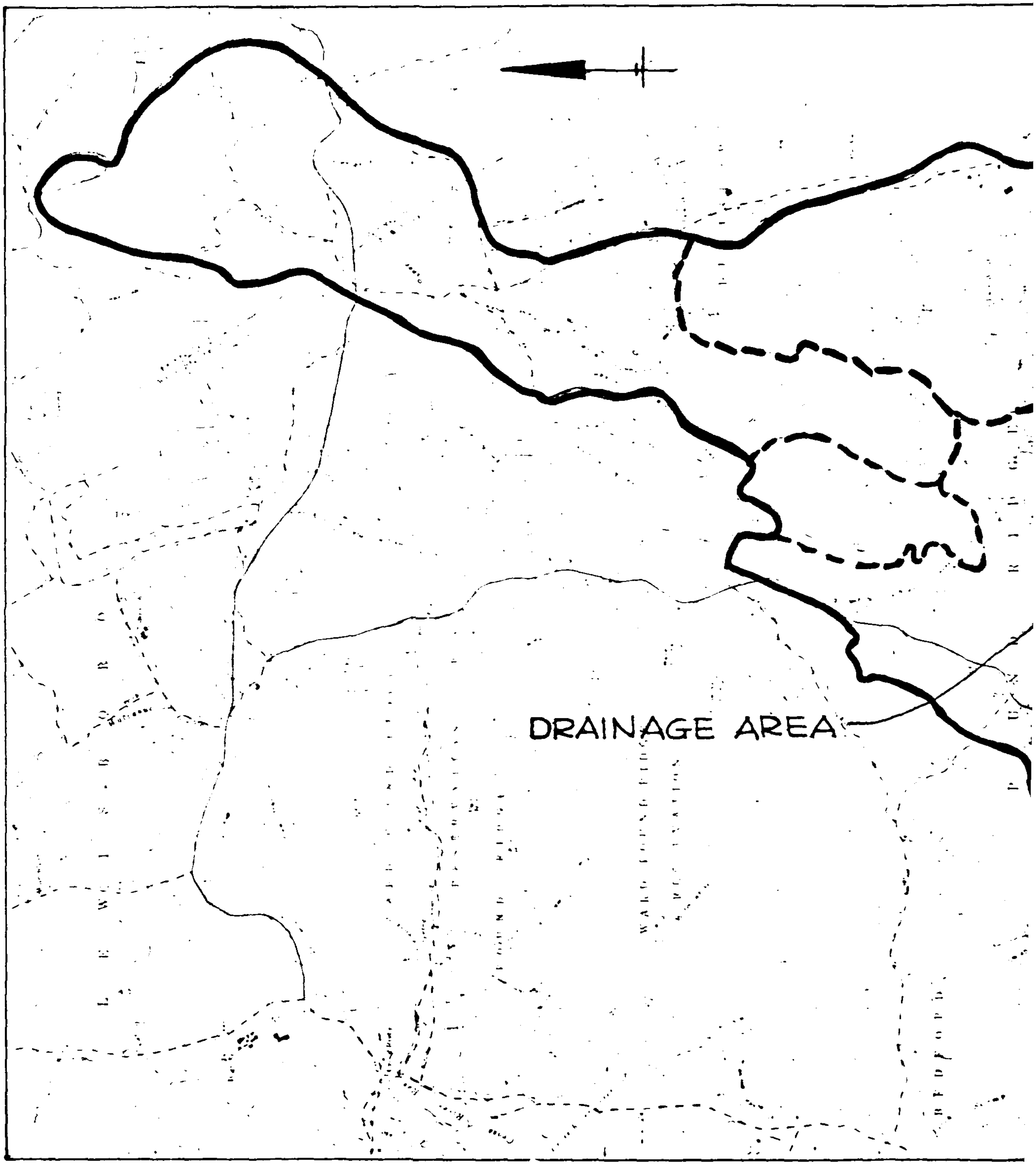


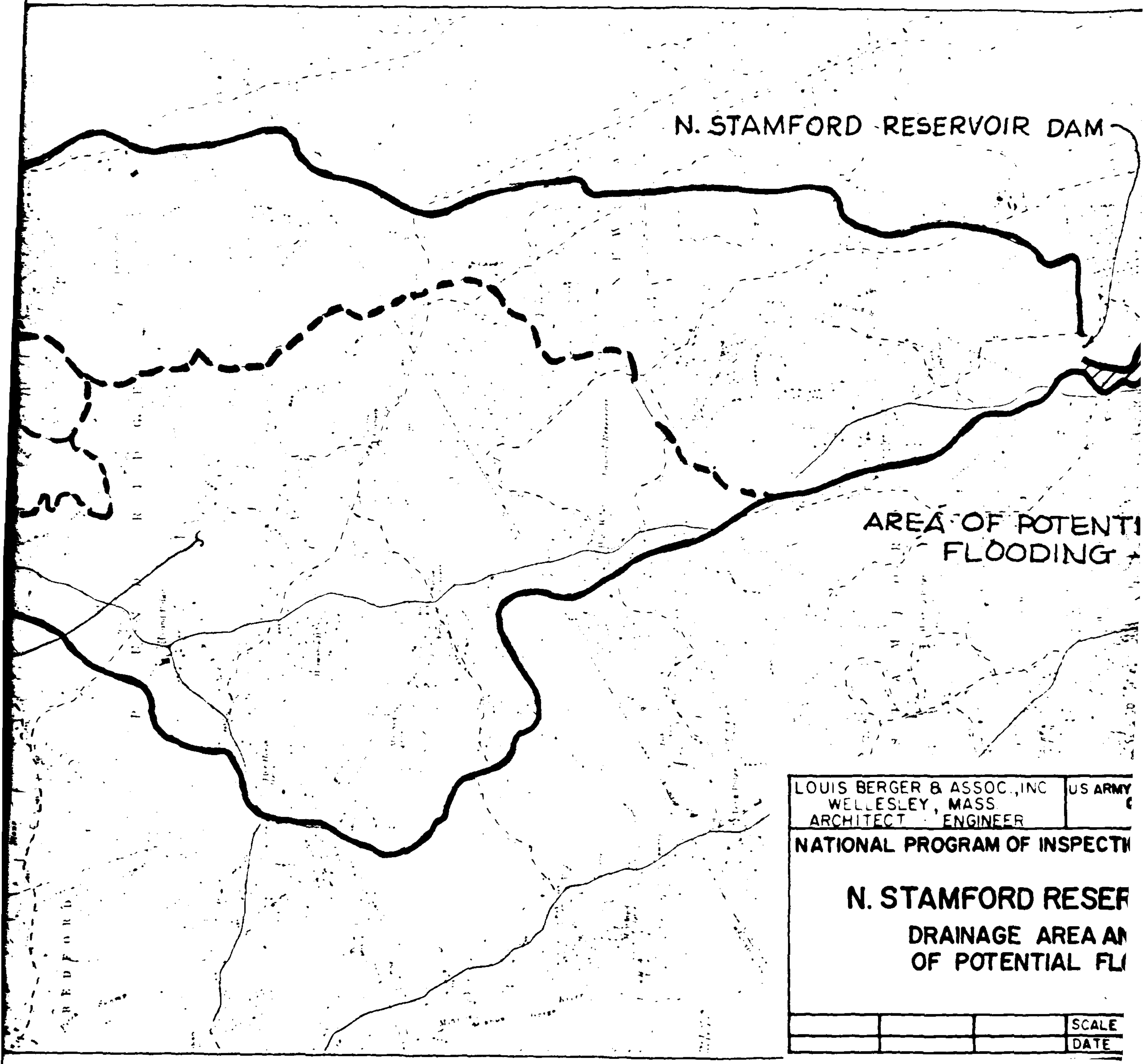
$Q = 1.62 A r^{2/3}$

Elev.	Width	Δ Area	Σ Area	w.p.	r	$r^{2/3}$	Q
113	90		0				
120	130	770	770	131.2	5.86	3.25	4059
125	160	725	1495	162.8	9.18	4.39	10627
130	190	875	2370	194.4	12.19	5.30	20350
135	205	988	3358	212.4	15.81	6.30	34216
140	220	1062	4420	230.4	19.18	7.17	51364



Valley storage
Dam to Sta 40+00 Vol = $\frac{4200 \times 4000}{43560}$ = 386 AF
Sta 40+00 to 95+00 Vol = $\frac{5500 \times 4200}{43560}$ = 530
916 AF


DRAINAGE AREA


N. STAMFORD RESERVOIR DAM
AREA OF POTENTI
FLOODING
BEDFORD
LOUIS BERGER & ASSOC.,INC
WELLESLEY, MASS
ARCHITECT ENGINEER
US ARMY
NATIONAL PROGRAM OF INSPECTI
N. STAMFORD RESER
DRAINAGE AREA AN
OF POTENTIAL FL
SCALE
DATE

FI
SH

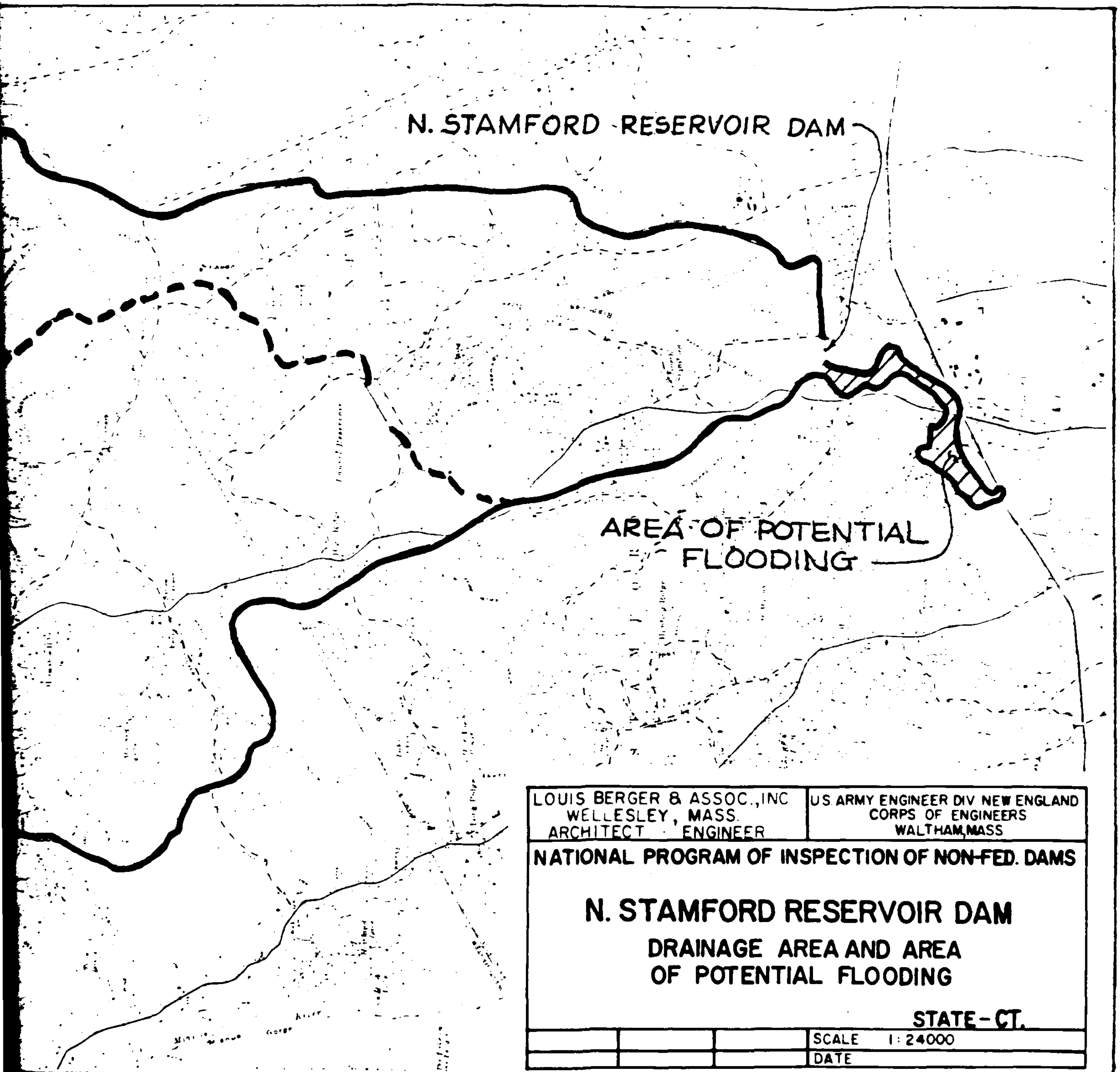
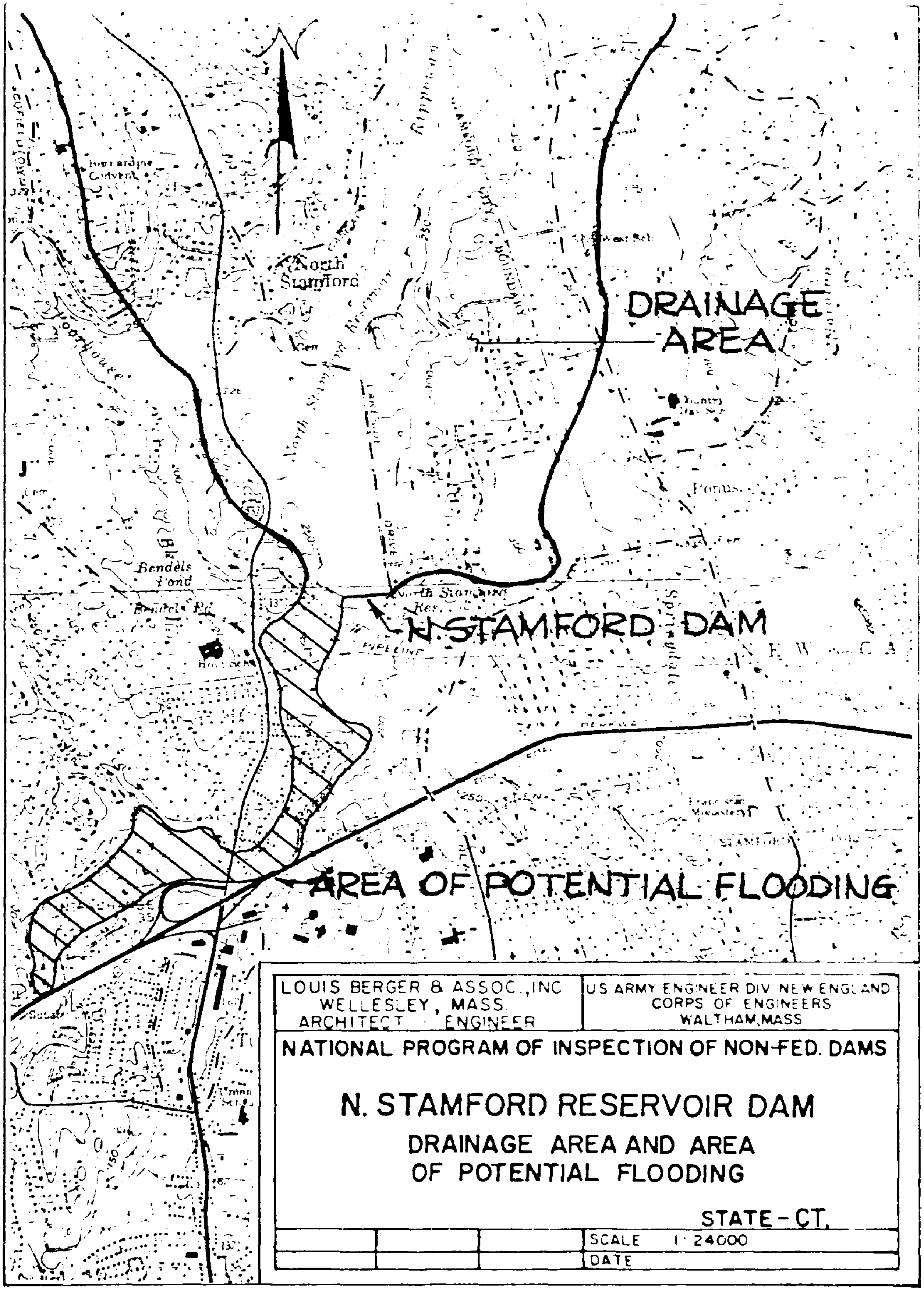


FIGURE 4
SHEET D-17



LOUIS BERGER & ASSOC., INC WELLESLEY, MASS. ARCHITECT - ENGINEER	US ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

N. STAMFORD RESERVOIR DAM

DRAINAGE AREA AND AREA OF POTENTIAL FLOODING

STATE - CT.

SCALE 1:24000

DATE

FIG 4A, Sheet D-17A

```
NORTH STAMFORD DAM INSPECTION
BY D.J.MULLIGAN
JANUARY 1979

                         JOB SPECIFICATION
     NO    NHR   NMIN   IDAY    IHR   IMIN METRC   IPLT   IPRT NSTAN
    150      0     30      0      0      0     0      2      0     0
                         JOPER     NWT
                             7       0

***********      ***********      ***********      ***********      ***********

                     SUB-AREA RUNOFF COMPUTATION

INFLOW TO MILL RESERVOIR
            ISTAQ   ICOMP   IECON   ITAPE    JPLT    JPRT   INAME
                1       0       0       0       0       0       1

                          HYDROGRAPH DATA
  IHYDG    IUHG   TAREA    SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
      0      -1    4.07     0.0    4.07     0.0     0.0       0       1       0

                          PRECIP DATA
                      SPFE   SIGRM     DAJ     DAK
                        12     0.0     0.0     0.0
                          PRECIP PATTERN
  0.40     0.40     0.89     1.07     1.16     1.34     1.70     4.94     1.16     1.16
  0.98     0.80

                          LOSS DATA
  STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
    0.0     0.0    1.00     0.5     0.0    1.00     0.0     0.0     0.0     0.0

                    GIVEN UNIT GRAPH, NUHGQ=  76
     [illegible]       [illegible]       [illegible]        0.        0.        0.        0.        0.        0.        0.
     4.       17.       [illegible]       66.      100.      141.      190.      234.      255.      302.
   [illegible]      [illegible]      [illegible]      [illegible]      269.      265.      241.      217.      189.      169.
   [illegible]      [illegible]      [illegible]      105.       94.       85.       74.       66.       58.       51.
    44.       39.       [illegible]       31.       28.       25.       22.       20.       18.       16.
    14.       12.       11.       10.        9.        8.        7.        6.        5.        5.
     4.        4.        [illegible]        3.        3.        2.        2.        2.        2.        1.
        UNIT GRAPH TOTALS   [illegible]. CFS OR 1.31 INCHES OVER THE AREA

                          RECESSION DATA
             STRTQ=    0.0     QRCSN=    0.0     RTIOR= 1.00
```

FULL PMF

NS-1

D-18

N5-Z

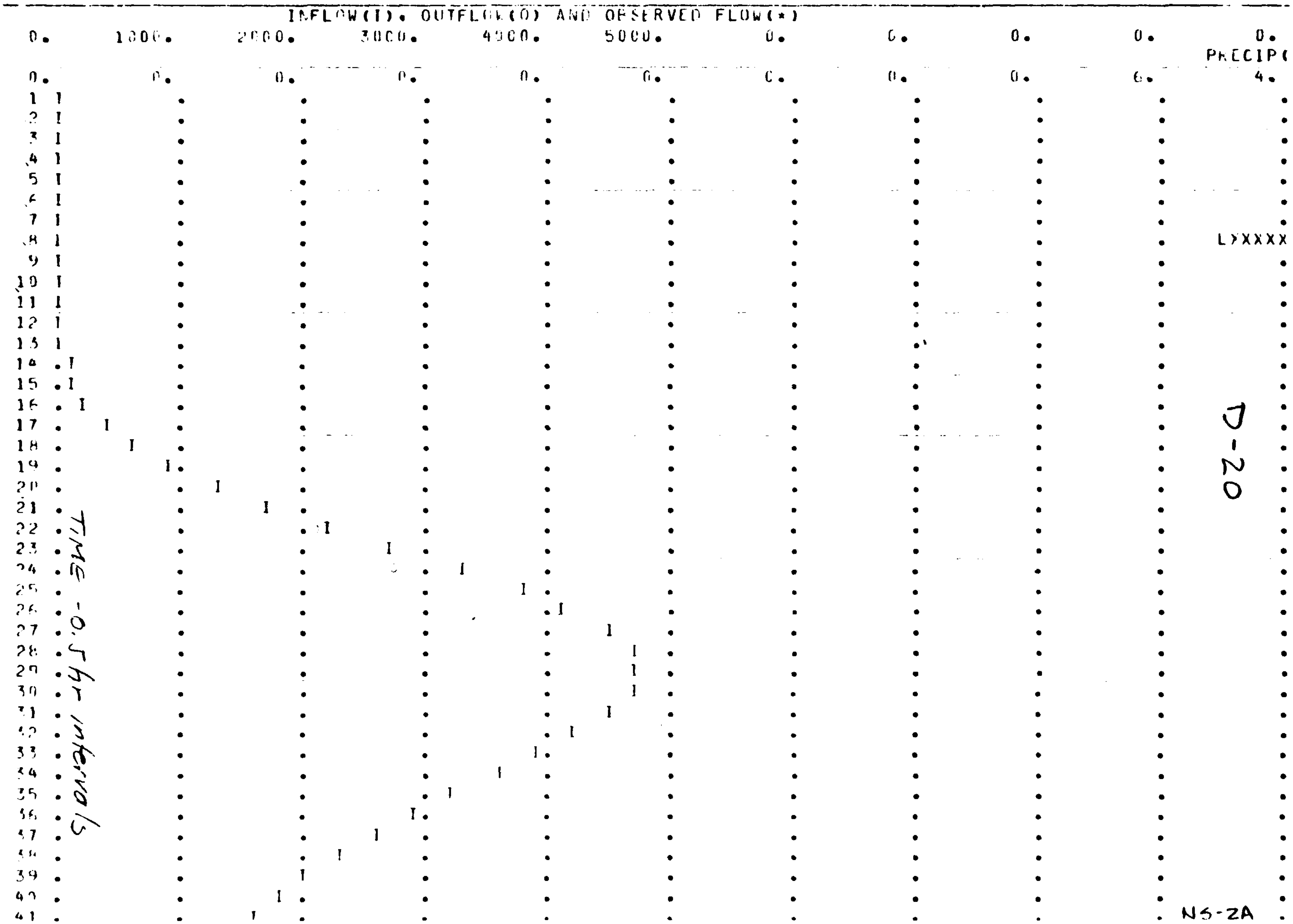
END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.40	0.40	0.
2	0.40	0.40	0.
3	0.89	0.89	0.
4	1.07	1.07	0.
5	1.16	1.16	0.
6	1.34	1.34	0.
7	1.70	1.70	0.
8	4.94	4.94	0.
9	1.16	1.16	0.
10	1.16	1.16	0.
11	0.98	0.98	2.
12	0.80	0.80	8.
13	0.0	0.0	25.
14	0.0	0.0	61.
15	0.0	0.0	124.
16	0.0	0.0	222.
17	0.0	0.0	367.
18	0.0	0.0	580.
19	0.0	0.0	[illegible]74.
20	0.0	0.0	1265.
21	0.0	0.0	1693.
22	0.0	0.0	2200.
23	0.0	0.0	2739.
24	0.0	0.0	3289.
25	0.0	0.0	3774.
26	0.0	0.0	4125.
27	0.0	0.0	4504.
28	0.0	0.0	4683.
29	0.0	0.0	4736.
30	0.0	0.0	4660.
31	0.0	0.0	4490.
32	0.0	0.0	4229.
33	0.0	0.0	3915.
34	0.0	0.0	3579.
35	0.0	0.0	3237.
36	0.0	0.0	2887.
37	0.0	0.0	2551.
38	0.0	0.0	2293.
39	0.0	0.0	2036.
40	0.0	0.0	1813.
41	0.0	0.0	1608.
42	0.0	0.0	1430.
43	0.0	0.0	1266.
44	0.0	0.0	1126.
45	0.0	0.0	993.
46	0.0	0.0	883.
47	0.0	0.0	773.
48	0.0	0.0	684.
49	0.0	0.0	[illegible]
50	0.0	0.0	540.
51	0.0	0.0	477.
52	0.0	0.0	427.
53	0.0	0.0	381.
54	0.0	0.0	339.
55	0.0	0.0	304.
56	0.0	0.0	272.
57	0.0	0.0	242.
58	0.0	0.0	214.
59	0.0	0.0	189.
60	0.0	0.0	170.
61	0.0	0.0	151.
62	0.0	0.0	135.
63	0.0	0.0	119.
64	0.0	0.0	106.
65	0.0	0.0	93.
66	0.0	0.0	81.
67	0.0	0.0	74.
68	0.0	0.0	64.
69	0.0	0.0	5[illegible].
70	0.0	0.0	5[illegible].
71	0.0	0.0	45.
72	0.0	0.0	40.
73	0.0	0.0	32.
74	0.0	0.0	2[illegible].
75	0.0	0.0	2[illegible].
76	0.0	0.0	21.
77	0.0	0.0	13.
78	0.0	0.0	7.
79	0.0	0.0	[illegible]
80	0.0	0.0	[illegible]
81	0.0	0.0	1.

SUM 16.00 16.00 85086.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4736.	4102.	1753.	591.	85087.
INCHES		9.37	16.02	16.21	16.21
AC-FT		2035.	3478.	351[illegible].	3519.

STATION


INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0. 1000. 2000. 3000. 4000. 5000. 0. 0. 0. 0. 0.
PRECIP(
LYXXXX
D-20
NS-2A
TIME -0.5 hr intervals

***** *********** *********** *********** ***********

HYDROGRAPH ROUTING

ROUTING THROUGH MILL RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
1111	1	0	0	2	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE=	64.	132.	204.	279.	359.	443.	533.	631.	739.	863.
OUTFLOW=	423.	967.	1855.	2952.	4249.	5732.	7408.	9209.	11070.	12965.

TIME	EOP STOR	AVG IN	EOP OUT
1	71.	0.	0.
2	64.	0.	323.
3	53.	0.	217.
4	45.	0.	146.
5	40.	0.	98.
6	37.	0.	66.
7	35.	0.	44.
8	33.	0.	30.
9	32.	0.	20.
10	31.	0.	14.
11	31.	1.	9.
12	31.	5.	6.
13	31.	17.	11.
14	32.	44.	22.
15	35.	95.	45.
16	39.	175.	87.
17	46.	294.	155.
18	57.	475.	259.
19	73.	727.	412.
20	96.	1067.	627.
21	126.	1479.	906.
22	160.	1949.	1315.
23	198.	2470.	1784.
24	237.	3014.	2345.
25	275.	3531.	2895.
26	308.	3950.	3420.
27	336.	4314.	3869.
28	358.	4594.	4253.
29	372.	4709.	4486.
30	379.	4693.	4599.
31	378.	4575.	4586.
32	371.	4359.	4465.
33	359.	4072.	4255.
34	344.	3747.	4100.
35	325.	3408.	3703.
36	305.	3062.	3381.
37	285.	2734.	3057.
38	266.	2437.	2761.
39	247.	2164.	2484.

D-21

NS-3

NS-4

40	229.	1924.	2224.
41	213.	1711.	1986.
42	198.	1517.	1780.
43	184.	1347.	1605.
44	170.	1197.	1439.
45	158.	1062.	1286.
46	147.	941.	1146.
47	136.	831.	1018.
48	126.	733.	915.
49	117.	647.	827.
50	108.	574.	744.
51	100.	509.	667.
52	93.	453.	597.
53	86.	404.	534.
54	80.	360.	477.
55	75.	322.	426.
56	70.	283.	391.
57	66.	257.	340.
58	62.	228.	304.
59	58.	202.	270.
60	55.	180.	241.
61	53.	160.	214.
62	50.	143.	191.
63	48.	127.	170.
64	46.	113.	151.
65	44.	99.	134.
66	42.	87.	119.
67	41.	78.	105.
68	40.	69.	93.
69	39.	61.	83.
70	38.	54.	73.
71	37.	47.	65.
72	36.	43.	58.
73	35.	36.	51.
74	35.	30.	44.
75	34.	26.	38.
76	33.	23.	33.
77	33.	17.	28.
78	32.	10.	22.
79	32.	6.	17.
80	31.	4.	12.
81	31.	2.	9.
82	31.	0.	6.
83	30.	0.	4.
84	30.	0.	3.
85	30.	0.	2.
86	30.	0.	1.
87	30.	0.	1.
88	30.	0.	1.

SUM 86073.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4599.	4004.	1749.	598.	86073.
INCHES		9.15	15.99	16.39	16.39
AC-FT		1987.	3470.	3559.	3559.

```
**********          **********          **********          **********          **********

                              SUB-AREA RUNOFF COMPUTATION

       INFLOW TO TRINITY
                    ISTAQ   ICOMP   IECON   ITAPE   JPLT   JPRT   INAME
                       2       0       0       0      0      0      1

                                     HYDROGRAPH DATA
    IHYDG   IUHG   TAREA   SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
        0     -1    0.62    0.0    0.62     0.0     0.0       0       0       0

                                       PRECIP DATA
                               NP   STORM    DAJ     DAK
                               12     0.0    0.0     0.0
                                     PRECIP PATTERN
  0.40     0.46     0.99     1.07     1.16     1.34     1.70     4.94     1.16     1.16
  0.98     0.86

                                        LOSS DATA
    STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
      0.0     0.0    1.00     0.0     0.0    1.00     0.0     0.0     0.0     0.0

                              GIVEN UNIT GRAPH, NUHGQ=  20
     0.       0.       0.       0.       0.       0.       0.       0.       0.       0.
   129.     300.     198.      96.      47.      23.      11.       5.       3.       1.
         UNIT GRAPH TOTALS    813. CFS OR 1.02 INCHES OVER THE AREA
```

D-23

N.S.-5

RECESSION DATA

STRTQ= 0.0 QRCSN= 0.0 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.40	0.40	0.
2	0.40	0.40	0.
3	0.89	0.89	0.
4	1.07	1.07	0.
5	1.16	1.16	0.
6	1.34	1.34	0.
7	1.70	1.70	0.
8	4.94	4.94	0.
9	1.16	1.16	0.
10	1.16	1.16	0.
11	0.98	0.98	52.
12	0.80	0.80	172.
13	0.0	0.0	314.
14	0.0	0.0	523.
15	0.0	0.0	734.
16	0.0	0.0	846.
17	0.0	0.0	1[illegible]03.
18	0.0	0.0	1[illegible]01.
19	0.0	0.0	2189.
20	0.0	0.0	1746.
21	0.0	0.0	1310.
22	0.0	0.0	1034.
23	0.0	0.0	743.
24	0.0	0.0	402.
25	0.0	0.0	193.
26	0.0	0.0	95.
27	0.0	0.0	43.
28	0.0	0.0	14.
29	0.0	0.0	9.
30	0.0	0.0	3.
31	0.0	0.0	1.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2189.	1035.	271.	90.	130[illegible]5.
INCHES		15.53	16.26	16.26	16.26
AC-FT		514.	538.	538.	538.

N.S.6

HYDROGRAPH ROUTING

ROUTING THROUGH TRINITY RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
11	1	0	0	2	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE=	125.	250.	376.	502.	638.	758.	887.	1017.	1146.	12[illegible].
OUTFLOW=	117.	301.	382.	386.	391.	395.	399.	403.	1293.	1914.

TIME	EOP STOR	AVG IN	EOP OUT
1	127.	0.	0.
2	125.	0.	117.
3	120.	0.	110.
4	116.	0.	104.
5	112.	0.	97.
6	108.	0.	92.
7	104.	0.	86.
8	101.	0.	81.
9	97.	0.	76.
10	94.	0.	[illegible]
11	93.	26.	69.
12	94.	112.	72.
13	101.	245.	82.
14	115.	418.	102.
15	135.	615.	132.
16	161.	775.	170.
17	191.	925.	215.
18	245.	1305.	279.
19	301.	1895.	334.
20	[illegible]	1968.	376.
21	415.	1528.	383.
22	447.	1172.	384.
23	468.	889.	385.
24	476.	575.	385.
25	472.	298.	385.
26	462.	144.	385.
27	449.	69.	384.
28	435.	31.	384.
29	419.	13.	384.
30	404.	6.	383.
31	388.	2.	382.
32	372.	0.	380.
33	357.	0.	370.
34	342.	0.	360.
35	327.	0.	351.
36	313.	0.	341.
37	299.	0.	332.
38	285.	0.	324.
39	272.	0.	315.

D-25

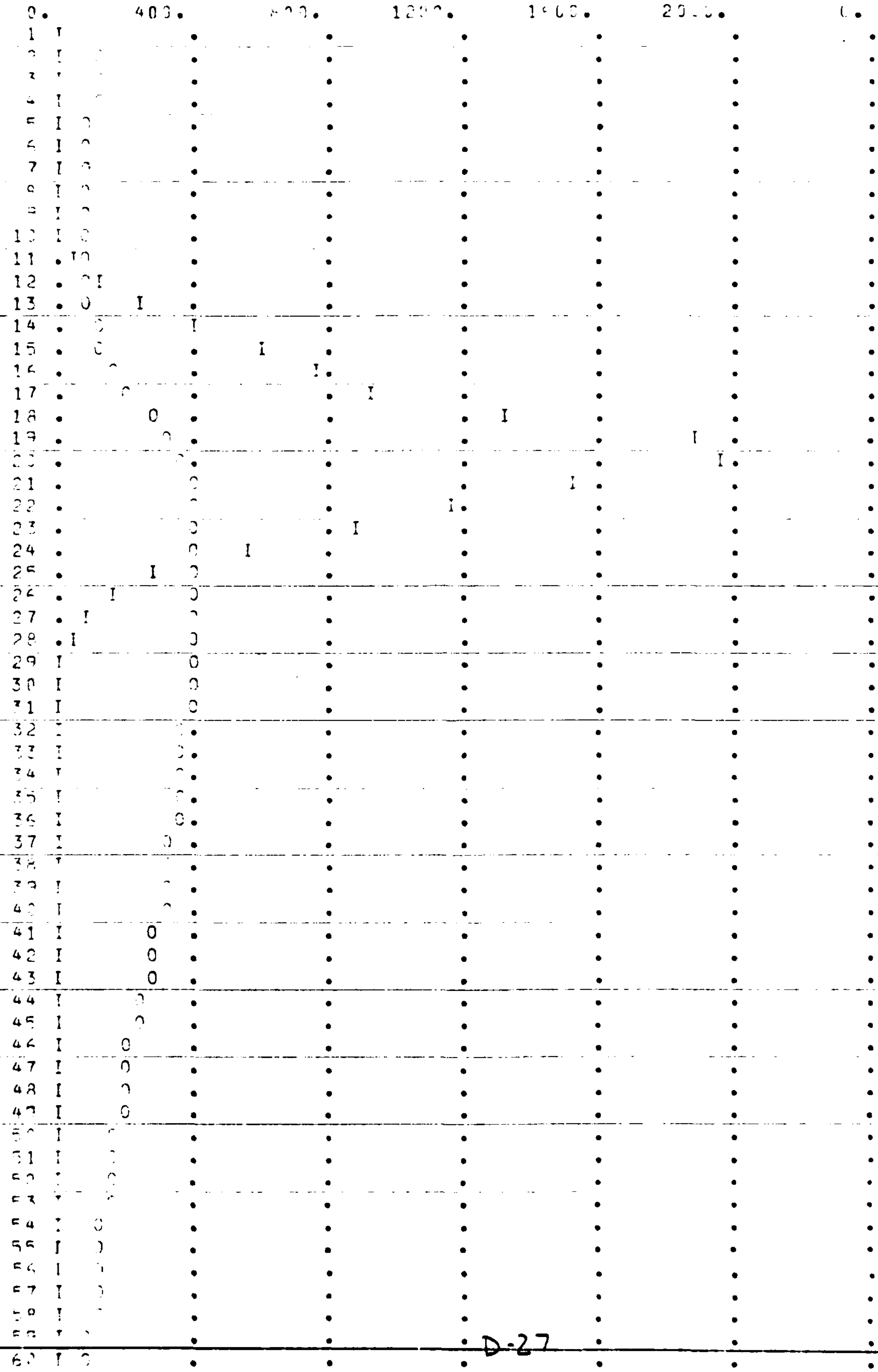
NS-7

N5-8

40	259.	0.	307.
41	247.	0.	296.
42	235.	0.	279.
43	224.	0.	262.
44	213.	0.	247.
45	203.	0.	232.
46	194.	0.	219.
47	185.	0.	206.
48	177.	0.	194.
49	169.	0.	182.
50	162.	0.	171.
51	155.	0.	161.
52	149.	0.	152.
53	143.	0.	143.
54	137.	0.	134.
55	131.	0.	126.
56	126.	0.	119.
57	122.	0.	112.
58	117.	0.	105.
59	113.	0.	99.
60	109.	0.	93.
61	105.	0.	88.
62	102.	0.	83.
63	98.	0.	78.
64	95.	0.	73.
65	92.	0.	69.
66	90.	0.	65.
67	87.	0.	61.
68	84.	0.	57.
69	82.	0.	54.
70	80.	0.	51.
71	78.	0.	48.
72	76.	0.	45.
73	74.	0.	42.
74	73.	0.	40.
75	71.	0.	37.
76	69.	0.	35.
77	68.	0.	33.
78	67.	0.	31.
79	65.	0.	29.
80	64.	0.	28.
81	63.	0.	26.
82	62.	0.	24.
83	61.	0.	23.
84	60.	0.	22.
85	59.	0.	20.
86	59.	0.	19.
87	58.	0.	18.
88	57.	0.	17.
89	56.	0.	16.
90	56.	0.	15.
91	55.	0.	14.
92	55.	0.	13.
93	54.	0.	13.
94	54.	0.	12.
95	53.	0.	11.
96	53.	0.	10.
97	52.	0.	10.
98	52.	0.	9.
99	51.	0.	9.
100	51.	0.	9.
101	51.	0.	8.
102	50.	0.	7.
103	50.	0.	7.
104	50.	0.	6.
105	50.	0.	6.
106	49.	0.	6.
107	49.	0.	5.
108	49.	0.	5.
109	49.	0.	5.
110	49.	0.	4.
111	48.	0.	4.
112	48.	0.	4.
113	[illegible]	0.	4.

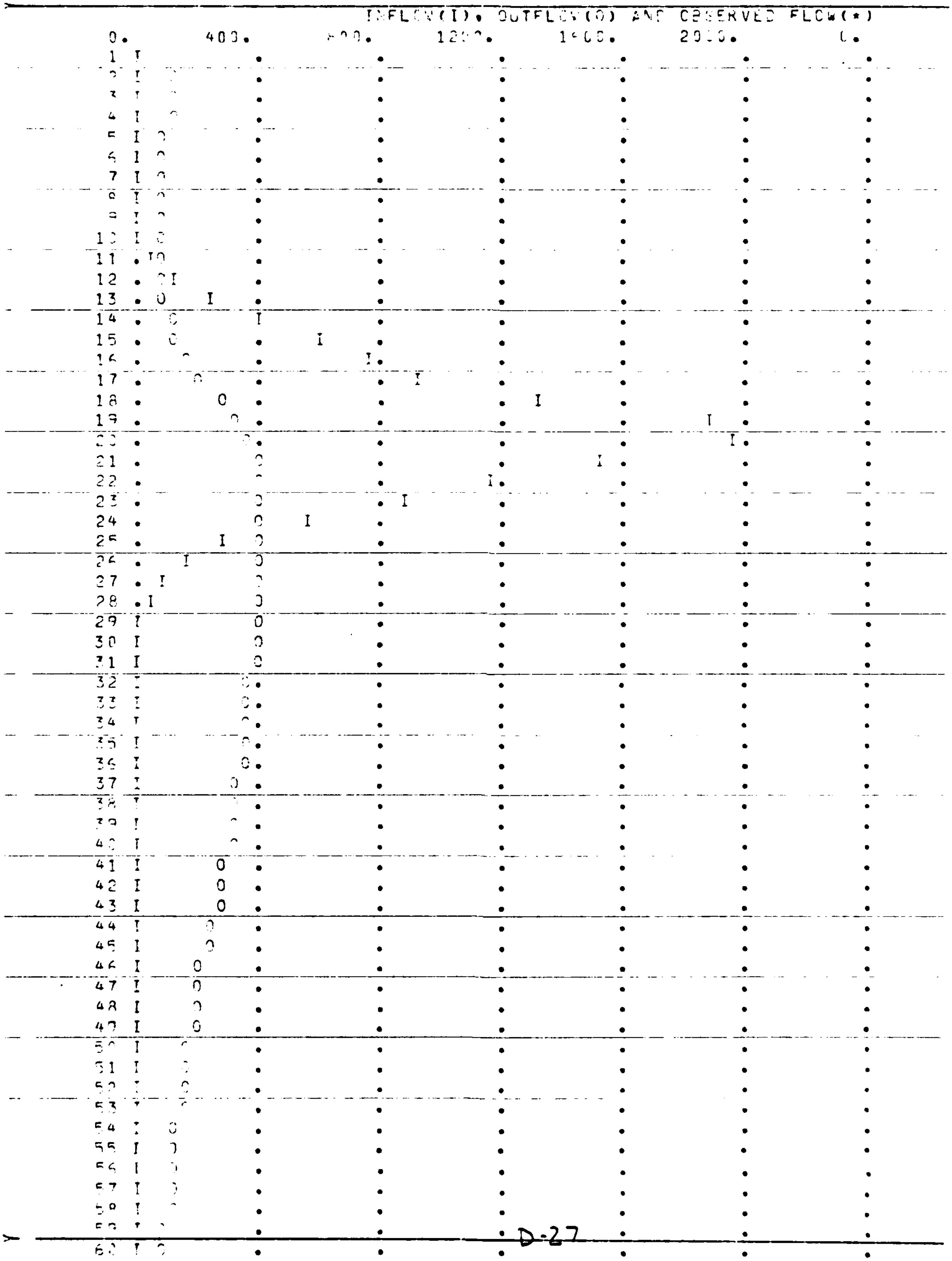
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	385.	384.	261.	104.	14583.
INCHES		5.79	15.67	18.73	18.73
AC-FT		190.	518.	619.	619.

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)



NS-8A

NS-RA


INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0. 400. 800. 1200. 1600. 2000. 0.

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 **********     **********     **********     **********     **********

                    SUB-AREA RUNOFF COMPUTATION

   INFLOW TO LAUREL
              ISTAQ    ICOMP    IECON    ITAPE    JPLT    JPRT    INAME
                  3        0        0        0       0       0        1

                              HYDROGRAPH DATA
   IHYDG    IUHG    TAREA    SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
       0      -1     9.50     0.0     9.50      0.0      0.0        0        0        0

                                PRECIP DATA
                       NP    STORM      DAJ      DAK
                       12      0.0      0.0      0.0
                              PRECIP PATTERN
   0.40     0.40     0.89     1.07     1.16     1.34     1.70     4.94     1.16     1.16
   0.98     0.80

                                 LOSS DATA
   STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
     0.0     0.0    1.00     0.0     0.0    1.00     0.0     0.0     0.0     0.0

                      GIVEN UNIT GRAPH, NUHGQ=   44
      0.       0.       0.       0.      34.     135.     287.     494.     738.     954.
   1092.    1160.    1100.    1012.     887.     759.     623.     523.     439.     368.
    310.     259.     216.     178.     145.     122.     103.      86.      75.      64.
     54.      41.      36.      31.      26.      21.      18.      16.      13.      10.
      9.       8.       7.       5.
          UNIT GRAPH TOTALS  12455. CFS OR 1.02 INCHES OVER THE AREA

                              RECESSION DATA
              STRTQ=    0.0     QRCSN=    0.0     RTIOR= 1.00
```

D-28

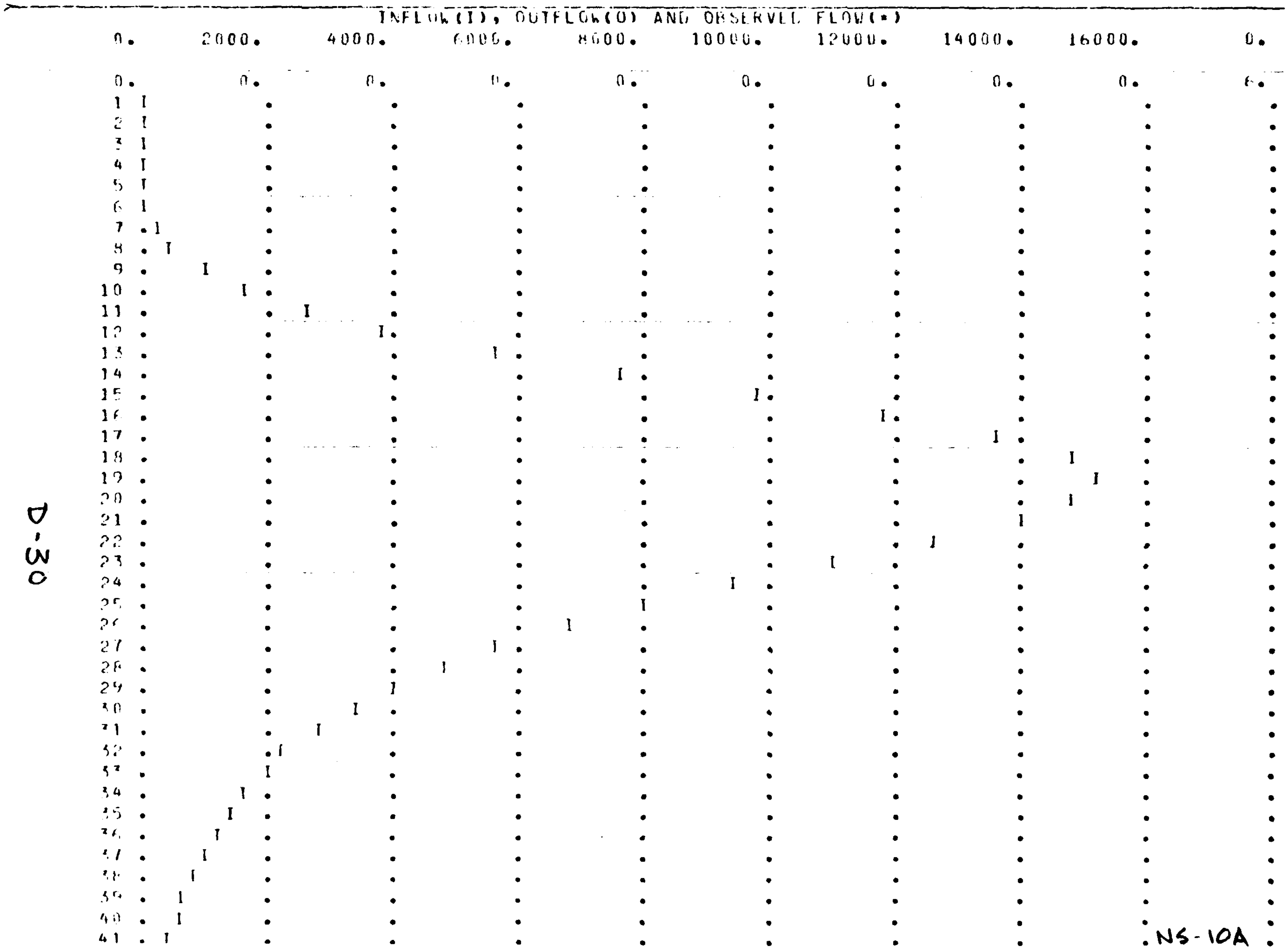
NS-9

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.40	0.40	0.
2	0.40	0.40	0.
3	0.89	0.89	0.
4	1.07	1.07	0.
5	1.16	1.16	14.
6	1.34	1.34	68.
7	1.70	1.70	199.
8	4.94	4.94	469.
9	1.16	1.16	932.
10	1.16	1.16	1626.
11	0.98	0.98	2575.
12	0.80	0.80	3891.
13	0.0	0.0	5609.
14	0.0	0.0	7590.
15	0.0	0.0	9740.
16	0.0	0.0	11876.
17	0.0	0.0	13640.
18	0.0	0.0	14769.
19	0.0	0.0	15194.
20	0.0	0.0	14849.
21	0.0	0.0	13922.
22	0.0	0.0	12499.
23	0.0	0.0	11088.
24	0.0	0.0	9490.
25	0.0	0.0	8065.
26	0.0	0.0	6789.
27	0.0	0.0	5686.
28	0.0	0.0	4754.
29	0.0	0.0	3975.
30	0.0	0.0	3329.
31	0.0	0.0	2764.
32	0.0	0.0	2295.
33	0.0	0.0	1920.
34	0.0	0.0	1607.
35	0.0	0.0	1344.
36	0.0	0.0	1138.
37	0.0	0.0	963.
38	0.0	0.0	804.
39	0.0	0.0	664.
40	0.0	0.0	564.
41	0.0	0.0	475.
42	0.0	0.0	397.
43	0.0	0.0	329.
44	0.0	0.0	280.
45	0.0	0.0	236.
46	0.0	0.0	194.
47	0.0	0.0	156.
48	0.0	0.0	129.
49	0.0	0.0	104.
50	0.0	0.0	78.
51	0.0	0.0	56.
52	0.0	0.0	28.
53	0.0	0.0	18.
54	0.0	0.0	10.
55	0.0	0.0	4.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	15194.	11902.	4151.	1384.	199278.
INCHES		11.65	16.26	16.26	16.26
AC-FT		5905.	8238.	8239.	8239.

NS-10


INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0. 2000. 4000. 6000. 8000. 10000. 12000. 14000. 16000. 0.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
NS-10A

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COMBINE HYDROGRAPHS

TOTAL INFLOW INTO LAUREL RESERVOIR COMBINING HILL & TRI

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
111111	2	0	0	2	0	1

SUM OF 2 HYDROGRAPHS AT111111

0.	117.	110.	104.	111.	159.	265.	550.	1009.	1198.
2645.	3962.	5690.	7691.	9872.	12046.	13855.	15048.	15528.	15225.
14305.	12984.	11473.	9875.	8448.	7174.	6070.	5138.	4358.	3703.
3146.	2675.	2290.	1967.	1694.	1479.	1293.	1127.	979.	871.
771.	676.	592.	527.	469.	413.	362.	322.	286.	249.
219.	180.	161.	144.	130.	119.	112.	105.	99.	93.
89.	83.	78.	73.	69.	65.	61.	57.	54.	51.
48.	45.	42.	40.	37.	35.	33.	31.	29.	28.
26.	24.	23.	22.	20.	19.	18.	17.	16.	15.
14.	13.	13.	12.	11.	10.	10.	9.	9.	8.
8.	7.	7.	6.	6.	6.	5.	5.	5.	4.
4.	4.	4.	3.	3.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	15528.	12196.	4407.	1488.	214259.
INCHES		11.21	16.20	16.41	16.41
AC-FT		6051.	8746.	8858.	8858.

routing outflow

***** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTING THROUGH LAUREL RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
1111111	1	0	0	2	0	1

ROUTING DATA

GLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE=	0.	262.	528.	797.	1070.	1347.	1627.	1910.	0.	0.
OUTFLOW=	0.	360.	1069.	2056.	3264.	4696.	11453.	22614.	0.	0.

D-32

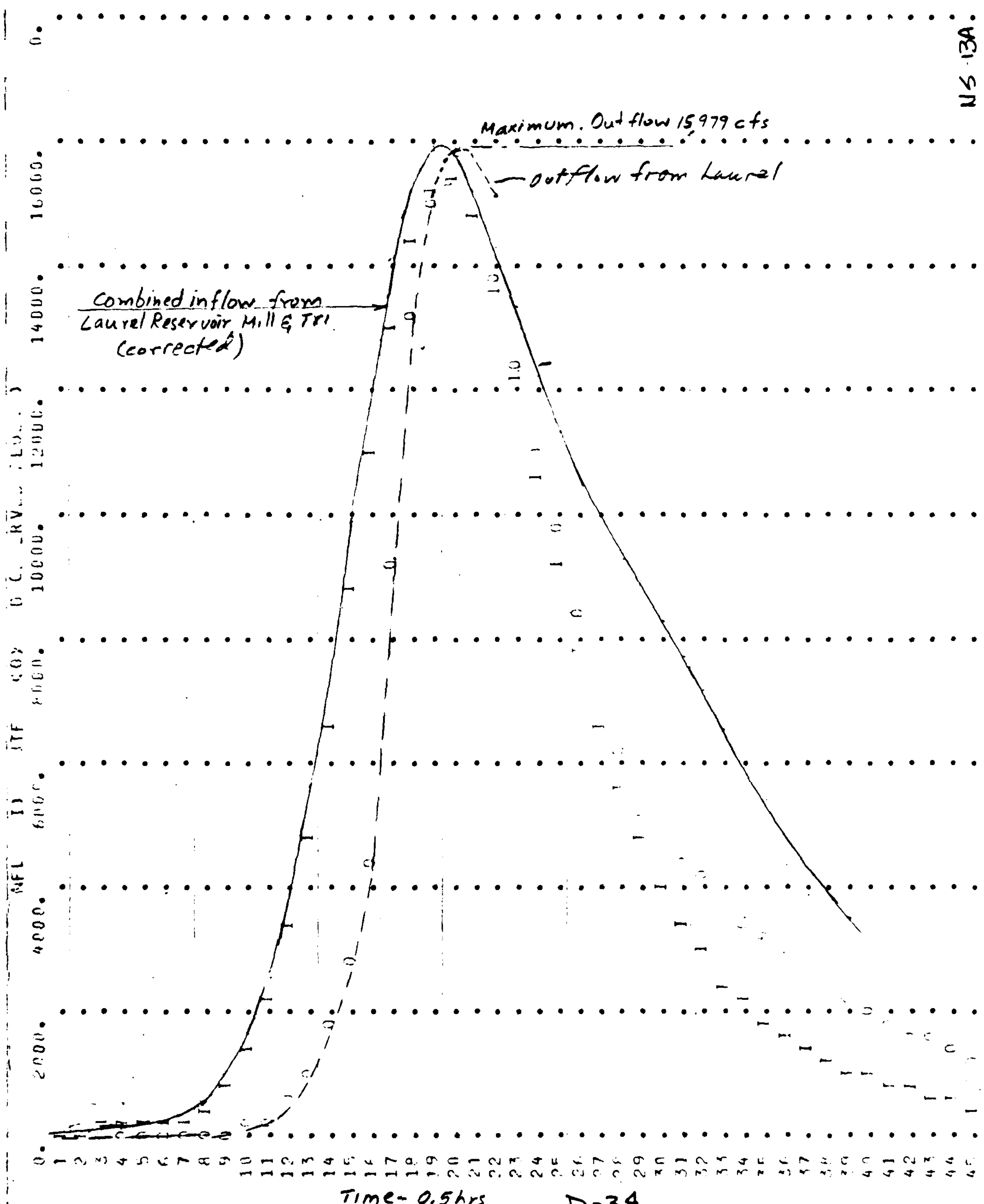
TIME	EOP STOR	AVG IN	EOP OUT
1	0.	0.	0.
2	2.	59.	3.
3	7.	114.	9.
4	11.	107.	15.
5	14.	107.	20.
6	19.	135.	26.
7	27.	222.	37.
8	42.	418.	56.
9	71.	779.	98.
10	122.	1353.	167.
11	202.	2171.	278.
12	322.	3303.	520.
13	491.	4826.	970.
14	711.	6691.	1745.
15	979.	8781.	2862.
16	1283.	10959.	4363.
17	1536.	12959.	8662.
18	1670.	14451.	13156.
19	1719.	15288.	15670.
20	1726.	15377.	15745.
21	1712.	14765.	14825.
22	1666.	13645.	13765.
23	1651.	12228.	12565.
24	1608.	10674.	11605.
25	1558.	9162.	9778.
26	1503.	7811.	8469.
27	1452.	6622.	7240.
28	1407.	5604.	6151.
29	1369.	4748.	5218.
30	1332.	4031.	4618.
31	1287.	3424.	4388.
32	1232.	2910.	4103.
33	1172.	2482.	3790.
34	1110.	2128.	3469.
35	1048.	1831.	3166.
36	988.	1587.	2903.
37	931.	1386.	2649.
38	876.	1210.	2409.
39	825.	1053.	2182.

NS 17

NS-13

40	777.	925.	1985.				
41	732.	821.	1821.	71	164.	49.	225.
42	690.	724.	1666.	72	156.	46.	215.
43	651.	634.	1520.	73	150.	44.	205.
44	614.	559.	1384.	74	143.	41.	196.
45	580.	499.	1259.	75	137.	39.	188.
46	548.	441.	1144.	76	131.	36.	179.
47	519.	387.	1045.	77	125.	34.	171.
48	492.	342.	972.	78	119.	32.	164.
49	465.	304.	902.	79	114.	30.	156.
50	441.	268.	836.	80	109.	28.	149.
51	417.	234.	773.	81	104.	27.	142.
52	395.	199.	713.	82	99.	25.	136.
53	373.	170.	657.	83	94.	24.	130.
54	354.	152.	604.	84	90.	22.	124.
55	335.	137.	555.	85	86.	21.	118.
56	318.	125.	510.	86	82.	20.	113.
57	303.	115.	469.	87	78.	19.	108.
58	289.	109.	431.	88	75.	18.	103.
59	276.	102.	397.	89	71.	17.	99.
60	264.	96.	366.	90	68.	16.	93.
61	253.	91.	348.	91	65.	15.	89.
62	243.	85.	333.	92	62.	14.	85.
63	232.	80.	319.	93	59.	13.	81.
64	223.	75.	306.	94	56.	12.	77.
65	213.	71.	293.	95	53.	11.	73.
66	204.	67.	280.	96	51.	11.	70.
67	195.	63.	268.	97	48.	10.	67.
68	187.	59.	257.	98	46.	10.	63.
69	179.	56.	246.	99	44.	9.	60.
70	171.	52.	235.	100	42.	8.	58.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	15345.	11371.	4280.	1487.	214180.
INCHES		10.45	15.74	16.40	16.41
AC-FT		5641.	8494.	8854.	8855.


Maximum. Outflow 15,979 cfs
outflow from Laurel
Combined inflow from Laurel Reservoir Mill & Tri (corrected)
0.
2000.
4000.
6000.
8000.
10000.
12000.
14000.
16000.
Time- 0.5hrs
NS 13A

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SUB-AREA RUNOFF COMPUTATION

INFLOW TO NORTH STAMFORD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
4	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	9.00	0.0	9.00	0.0	0.0	0	0	0

PRECIP DATA

NP	STORM	DAJ	DAK
12	0.0	0.0	0.0

PRECIP PATTERN

0.40	0.40	0.89	1.07	1.16	1.34	1.70	4.94	1.16	1.16
0.98	0.80								

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.0	0.0	1.00	0.0	0.0	1.00	0.0	0.0	0.0	0.0

GIVEN UNIT GRAPH, NUHGQ= 64

5.	16.	35.	64.	95.	141.	179.	234.	292.	350.
403.	452.	490.	513.	535.	545.	547.	526.	505.	479.
451.	415.	390.	359.	326.	296.	272.	248.	223.	209.
191.	174.	161.	148.	133.	123.	112.	100.	93.	84.
75.	69.	63.	58.	53.	49.	45.	41.	38.	36.
34.	30.	27.	24.	22.	20.	18.	17.	16.	15.
13.	12.	11.	10.						

UNIT GRAPH TOTALS 11699. CFS OR 1.01 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.0 QRCSN= 0.0 RTIOR= 1.00

D-35

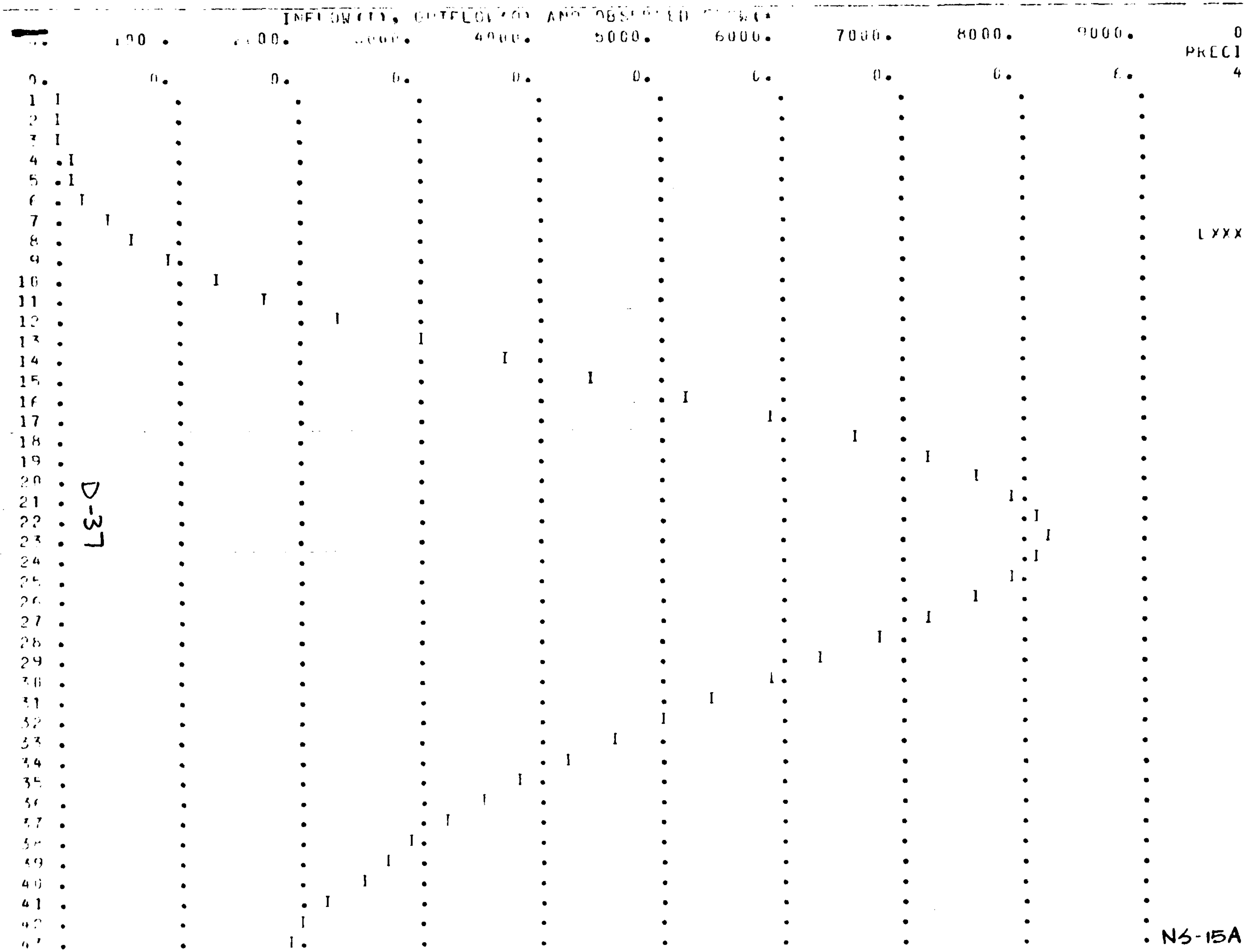
NS-14

NS-15

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.40	0.40	2.
2	0.40	0.40	8.
3	0.89	0.89	25.
4	1.07	1.07	59.
5	1.16	1.16	118.
6	1.34	1.34	214.
7	1.70	1.70	352.
8	4.94	4.94	565.
9	1.16	1.16	861.
10	1.16	1.16	1254.
11	0.98	0.98	1750.
12	0.80	0.80	2321.
13	0.0	0.0	2995.
14	0.0	0.0	3679.
15	0.0	0.0	4443.
16	0.0	0.0	5208.
17	0.0	0.0	5944.
18	0.0	0.0	6611.
19	0.0	0.0	7194.
20	0.0	0.0	7647.
21	0.0	0.0	7949.
22	0.0	0.0	8141.
23	0.0	0.0	8189.
24	0.0	0.0	8078.
25	0.0	0.0	7877.
26	0.0	0.0	7576.
27	0.0	0.0	7201.
28	0.0	0.0	6779.
29	0.0	0.0	6314.
30	0.0	0.0	5880.
31	0.0	0.0	5423.
32	0.0	0.0	4973.
33	0.0	0.0	4552.
34	0.0	0.0	4175.
35	0.0	0.0	3813.
36	0.0	0.0	3475.
37	0.0	0.0	3198.
38	0.0	0.0	2925.
39	0.0	0.0	2675.
40	0.0	0.0	2454.
41	0.0	0.0	2243.
42	0.0	0.0	2046.
43	0.0	0.0	1872.
44	0.0	0.0	1706.
45	0.0	0.0	1547.
46	0.0	0.0	1415.
47	0.0	0.0	1287.
48	0.0	0.0	1167.
49	0.0	0.0	1067.
50	0.0	0.0	976.
51	0.0	0.0	894.
52	0.0	0.0	813.
53	0.0	0.0	754.
54	0.0	0.0	693.
55	0.0	0.0	636.
56	0.0	0.0	585.
57	0.0	0.0	541.
58	0.0	0.0	495.
59	0.0	0.0	450.
60	0.0	0.0	412.
61	0.0	0.0	375.
62	0.0	0.0	342.
63	0.0	0.0	311.
64	0.0	0.0	283.
65	0.0	0.0	253.
66	0.0	0.0	234.
67	0.0	0.0	204.
68	0.0	0.0	174.
69	0.0	0.0	153.
70	0.0	0.0	124.
71	0.0	0.0	101.
72	0.0	0.0	47.
73	0.0	0.0	32.
74	0.0	0.0	19.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8189.	7463.	3776.	1300.	167180.
INCHES		7.71	15.61	16.12	16.12
AC-FT		3703.	7494.	7739.	7739.


INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
100.
4000.
5000.
6000.
7000.
8000.
9000.
PRECI
LXXX

D-37

N5-15A

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COMBINE HYDROGRAPHS

TOTAL INFLOW TO NORTH STANFORD INCLUDING OUTFLOW FROM L

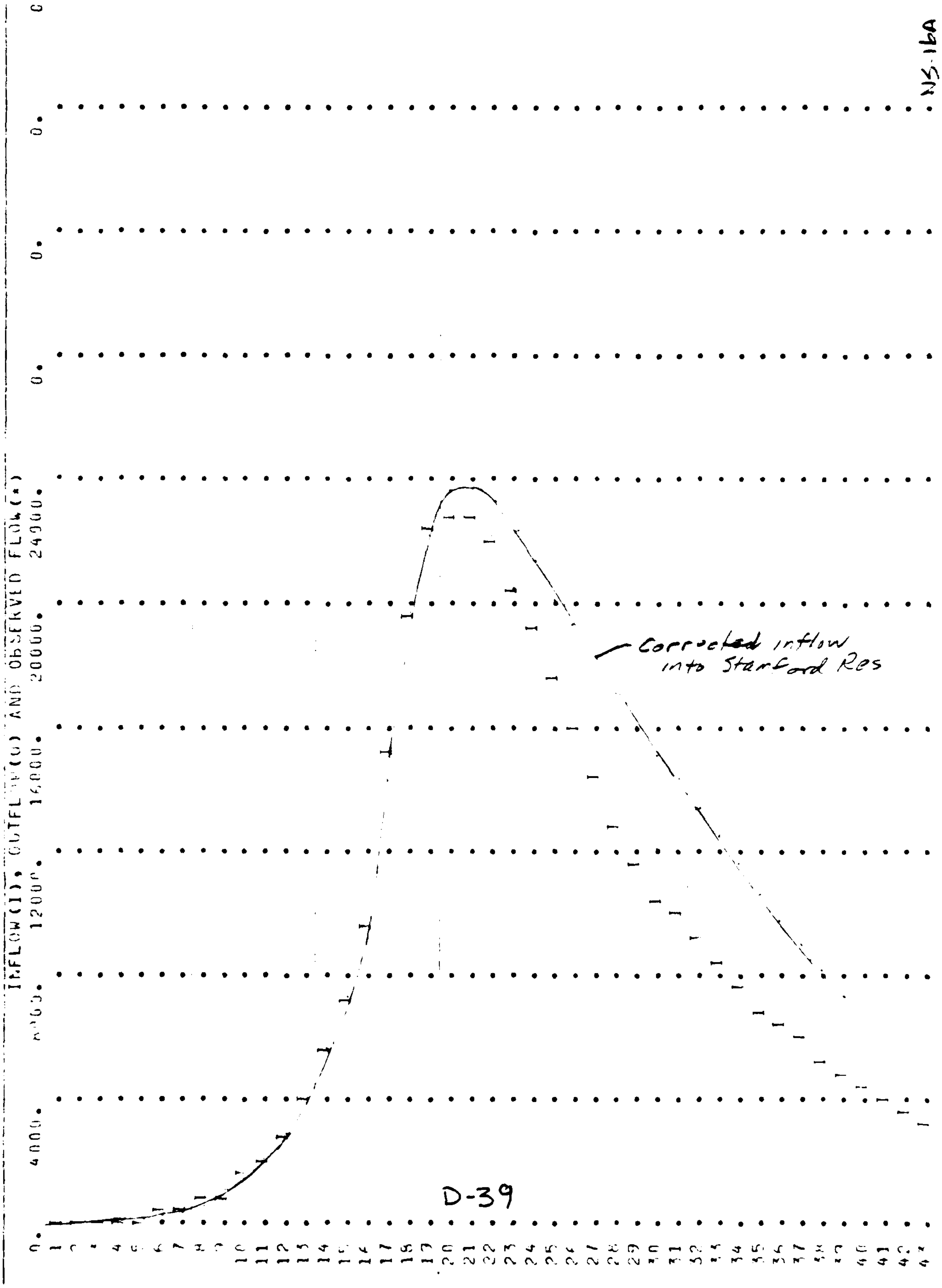
ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
10	2	0	0	2	0	1

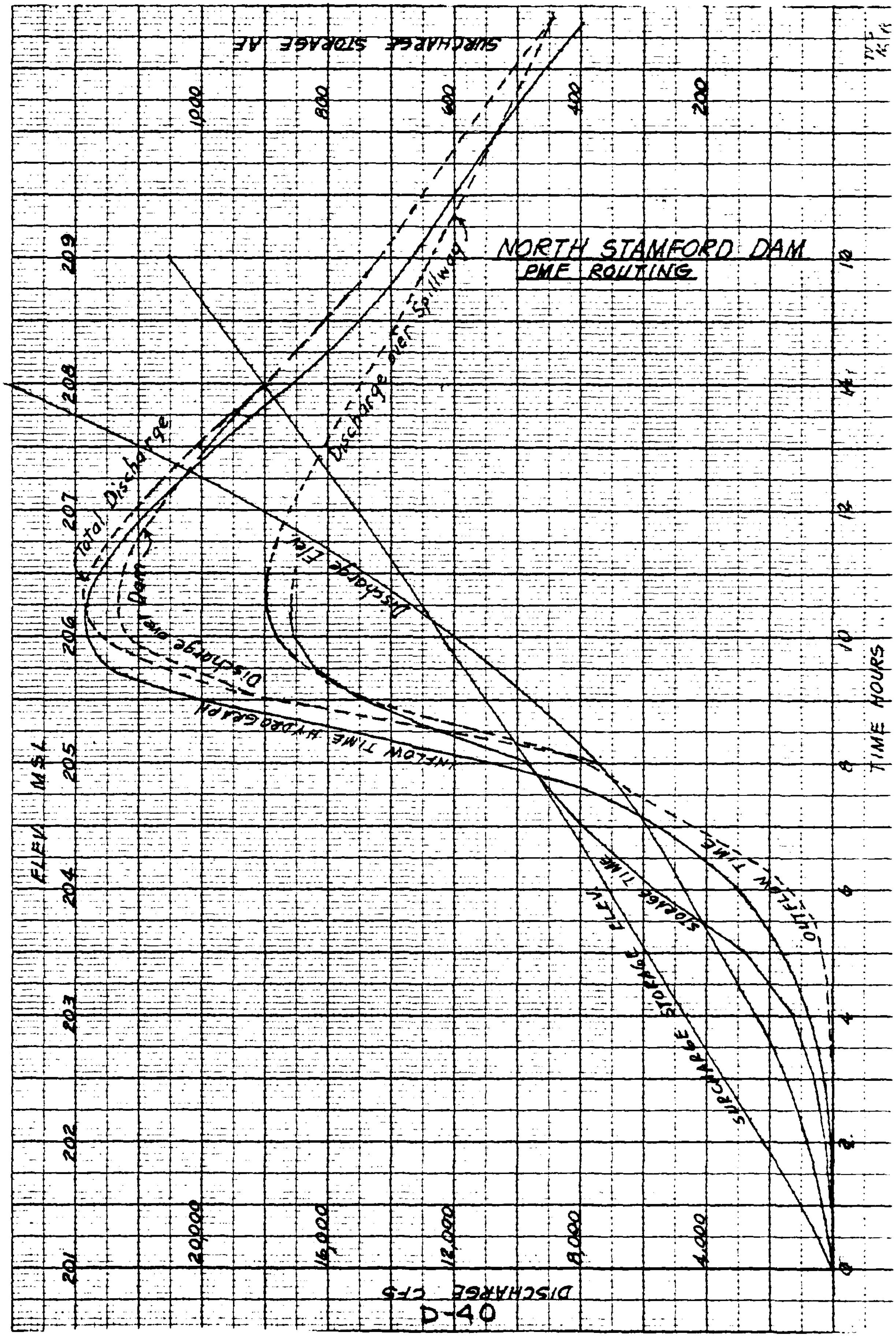
SUM OF 2 HYDROGRAPHS AT 10

2.	12.	34.	74.	137.	240.	369.	623.	959.	1421.
2028.	2841.	3965.	5421.	7305.	9571.	15206.	19767.	22265.	22992.
22773.	21906.	20574.	19683.	17655.	16045.	14441.	12931.	11532.	10498.
9810.	9075.	8342.	7644.	6951.	6378.	5847.	5334.	4857.	4439.
4069.	3712.	3392.	3091.	2807.	2559.	2332.	2139.	1969.	1812.
1667.	1532.	1416.	1297.	1191.	1095.	1010.	927.	850.	778.
722.	675.	631.	589.	551.	515.	476.	435.	399.	363.
326.	261.	237.	215.	196.	179.	171.	164.	156.	149.
142.	136.	130.	124.	118.	113.	108.	103.	98.	93.
89.	85.	81.	77.	73.	70.	67.	63.	60.	58.
55.	52.	50.	47.	45.	43.	41.	39.	37.	35.
34.	32.	30.	29.	27.	26.	25.	24.	22.	21.
20.	19.	18.	17.	17.	16.	15.	14.	14.	13.
12.	12.	11.	10.	10.	9.	9.	9.	8.	8.
7.	7.	7.	6.	6.	6.	5.	5.	5.	5.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	22992.	18807.	8042.	2787.	401364.
INCHES		9.19	15.65	16.27	16.27
AC-FT		9326.	15959.	16594.	16594.

To be corrected by revision of Laurel outflow


INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0.
4000.
8000.
12000.
16000.
20000.
24000.
0.
0.
0.
0
Corrected inflow into Stanford Res
NS-16A


NORTH STAMFORD DAM
PMF ROUTING
SURCHARGE STORAGE AF
ELEV MSL
DISCHARGE CFS
TIME HOURS
Total Discharge
Discharge over Dam
Discharge over Spillway
Discharge Elev
INFLOW TIME HYDROGRAPH
OUTFLOW TIME
STORAGE TIME
SURCHARGE STORAGE ELEV

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SUB-AREA RUNOFF COMPUTATION

INFLOW TO MILL RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
1	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	4.07	0.0	4.07	0.0	0.500	0	0	0

0.5 PMF

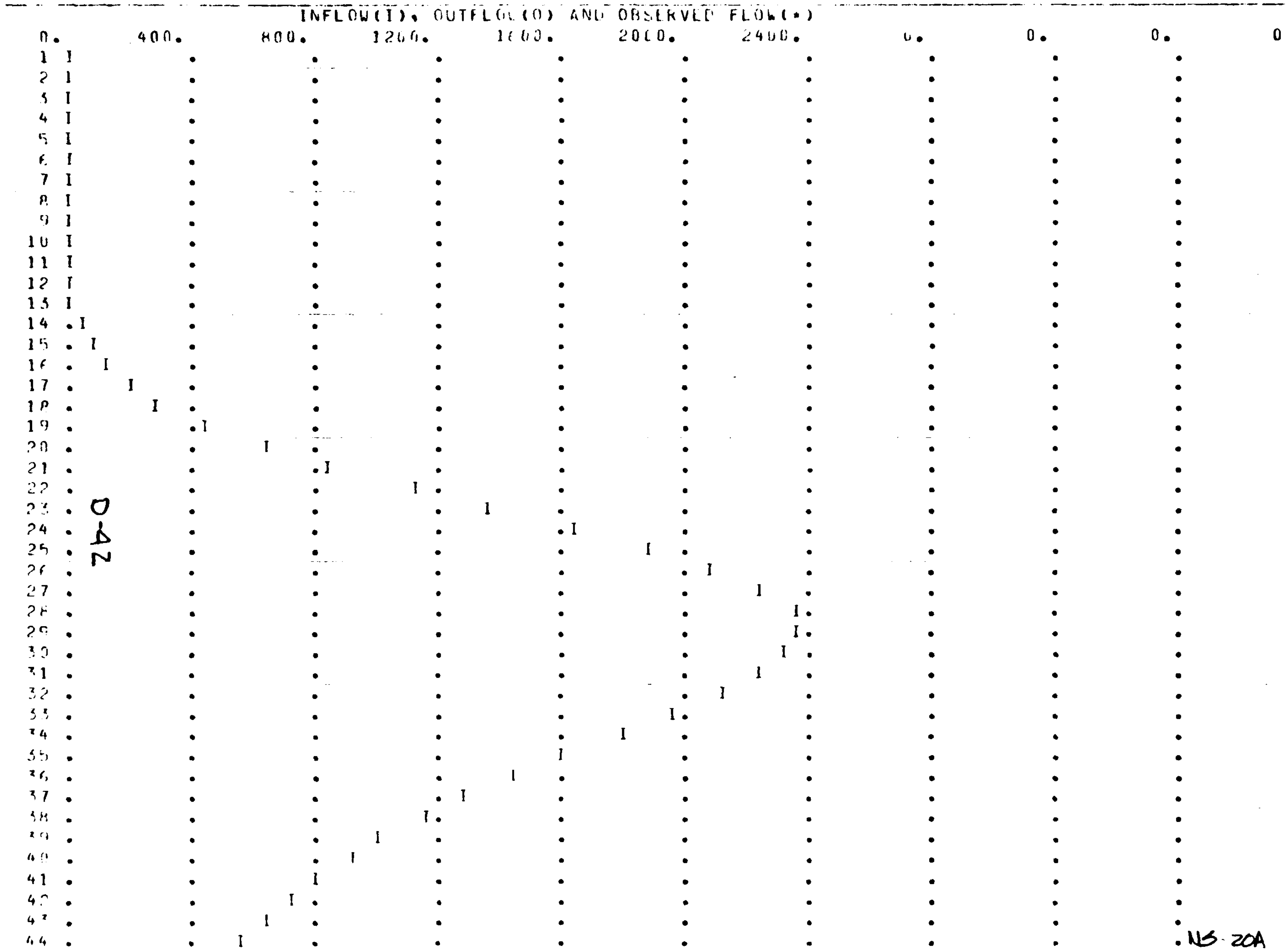
D-41

RUNOFF MULTIPLIED BY 0.50

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	4.	13.	31.	62.	111.	183.	290.	437.	630.
849.	1190.	1376.	1644.	1867.	2362.	2252.	2342.	2368.	2330.
2245.	2114.	1958.	1790.	1618.	1444.	1291.	1146.	1018.	906.
804.	715.	634.	563.	499.	441.	390.	343.	304.	270.
239.	214.	191.	170.	152.	136.	121.	107.	95.	85.
76.	67.	60.	53.	47.	41.	37.	32.	29.	25.
23.	20.	16.	14.	12.	10.	7.	4.	2.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2568.	2051.	876.	295.	42544.
INCHES		4.69	8.01	8.10	8.10
AC-FT		1017.	1739.	1759.	1759.

N.S 20


INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0. 400. 800. 1200. 1600. 2000. 2400. 0. 0. 0. 0

NS-20A

D-42

HYDROGRAPH ROUTING

ROUTING THROUGH MILL RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
1111	1	0	0	2	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE	64.	132.	204.	275.	359.	443.	533.	631.	739.	863.
OUTFLOW	323.	967.	1855.	2952.	4249.	5732.	7408.	9209.	11070.	12965.

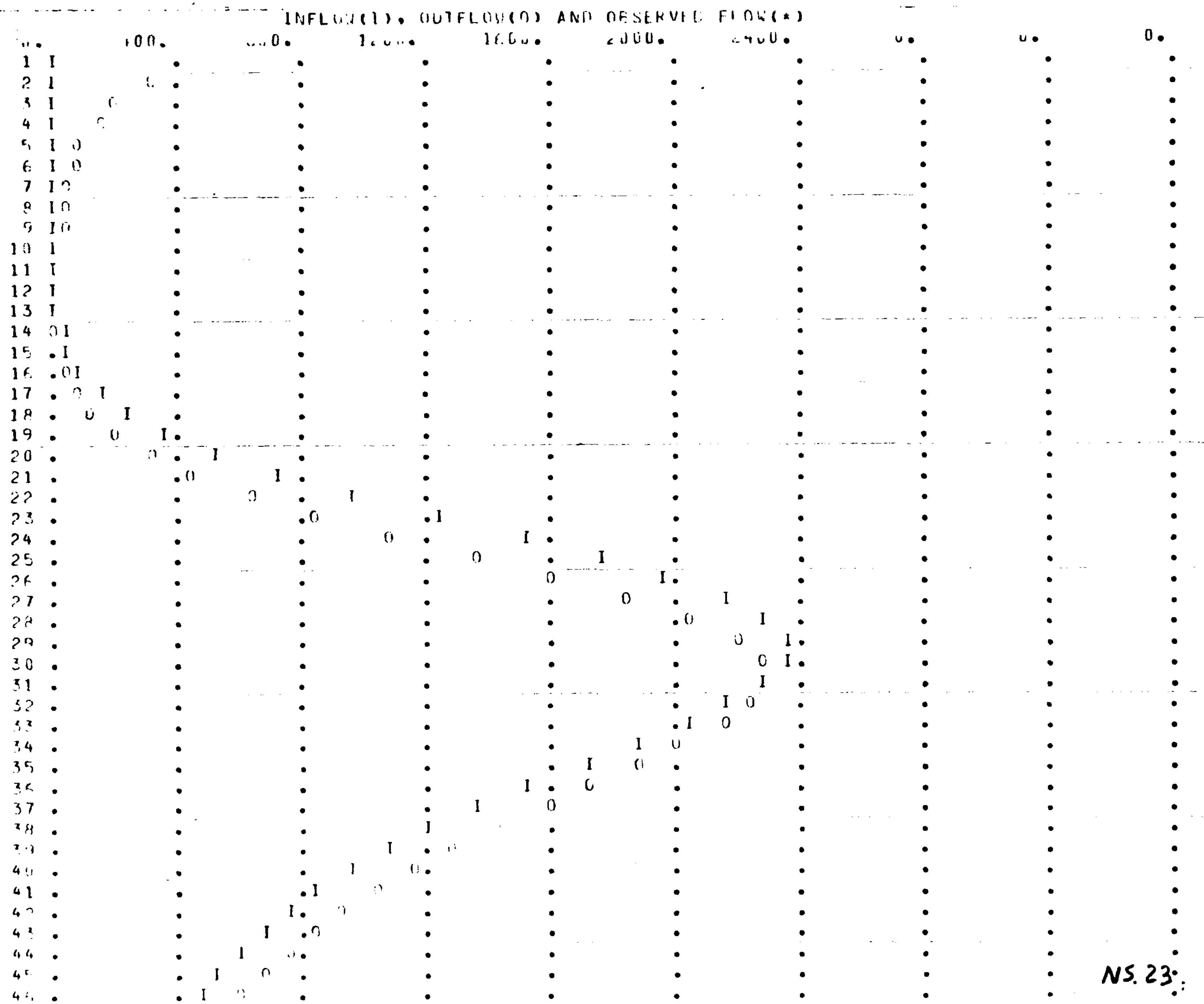
D-43

TIME	EOP STOR	AVG IN	EOP OUT				
1	71.	0.	0.	21	78.	740.	453.
2	64.	0.	323.	22	96.	975.	624.
3	55.	0.	217.	23	117.	1235.	824.
4	45.	0.	146.	24	140.	1507.	1067.
5	40.	0.	98.	25	163.	1766.	1351.
6	37.	0.	66.	26	184.	1975.	1604.
7	35.	0.	44.	27	202.	2157.	1829.
8	33.	0.	30.	28	217.	2297.	2042.
9	32.	0.	20.	29	227.	2355.	2187.
10	31.	0.	14.	30	232.	2349.	2262.
11	31.	0.	9.	31	233.	2288.	2274.
12	31.	2.	7.	32	230.	2180.	2250.
13	31.	9.	8.	33	223.	2036.	2140.
14	31.	22.	12.	34	215.	1874.	2016.
15	32.	46.	23.	35	205.	1704.	1871.
16	35.	85.	44.	36	194.	1551.	1731.
17	38.	147.	78.	37	182.	1367.	1583.
18	44.	237.	130.	38	170.	1218.	1435.
19	52.	363.	206.	39	158.	1082.	1292.
20	63.	534.	313.				

N.S.21.

N.S.22

40	147.	962.	1158.
41	138.	855.	1035.
42	128.	760.	932.
43	119.	675.	848.
44	111.	599.	766.
45	103.	531.	689.
46	95.	470.	618.
47	88.	415.	551.
48	82.	366.	491.
49	76.	323.	436.
50	71.	287.	387.
51	66.	255.	344.
52	62.	227.	305.
53	59.	202.	272.
54	55.	180.	242.
55	53.	161.	215.
56	50.	144.	192.
57	48.	128.	171.
58	46.	114.	152.
59	44.	101.	136.
60	43.	90.	121.
61	41.	80.	107.
62	40.	71.	96.
63	39.	64.	85.
64	38.	56.	76.
65	37.	50.	67.
66	36.	44.	59.
67	35.	39.	53.
68	35.	34.	47.
69	34.	30.	41.
70	34.	27.	37.
71	33.	24.	32.
72	33.	21.	29.
73	33.	18.	25.
74	32.	15.	22.
75	32.	13.	19.
76	32.	11.	17.
77	31.	8.	14.
78	31.	5.	11.
79	31.	3.	8.
80	31.	2.	6.
81	30.	1.	4.
82	30.	0.	3.
83	30.	0.	2.
84	30.	0.	1.
85	30.	0.	1.
86	30.	0.	1.



NS. 23

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SUB-AREA RUNOFF COMPUTATION

INFLOW TO TRINITY

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
2	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	0.62	0.0	0.62	0.0	0.500	0	0	0

D-46

RUNOFF MULTIPLIED BY 0.50

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
26.	86.	157.	261.	352.	423.	505.	801.	1094.	873.
657.	517.	372.	201.	97.	46.	22.	9.	4.	2.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1094.	518.	135.	45.	6504.
INCHES		7.77	8.13	8.13	8.13
AC-FT		257.	269.	269.	269.

N.S. 24.

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HYDROGRAPH ROUTING

ROUTING THROUGH TRINITY RESERVOIR

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
11	1	0	0	2	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE	125.	250.	376.	502.	630.	758.	887.	1017.	1148.	1260.
O.FLOW	117.	301.	382.	386.	391.	395.	399.	403.	1293.	2914.

TIME	EOP STOR	AVG IN	EOP OUT
1	127.	0.	0.
2	125.	0.	117.
3	120.	0.	110.
4	116.	0.	104.
5	112.	0.	97.
6	108.	0.	92.
7	104.	0.	86.
8	101.	0.	81.
9	97.	0.	76.
10	94.	0.	72.
11	92.	13.	66.
12	91.	56.	68.
13	94.	121.	71.
14	99.	209.	79.
15	108.	307.	92.
16	120.	380.	110.
17	134.	464.	151.
18	155.	653.	162.
19	187.	948.	208.
20	218.	984.	254.
21	238.	764.	284.
22	251.	586.	301.
23	256.	444.	305.
24	256.	286.	305.
25	249.	143.	300.
26	240.	72.	286.
27	230.	35.	272.
28	220.	15.	256.
29	210.	7.	242.
30	200.	3.	228.
31	191.	1.	214.
32	182.	0.	202.
33	174.	0.	190.
34	167.	0.	178.
35	160.	0.	168.
36	153.	0.	158.
37	147.	0.	149.
38	141.	0.	140.
39	135.	0.	132.

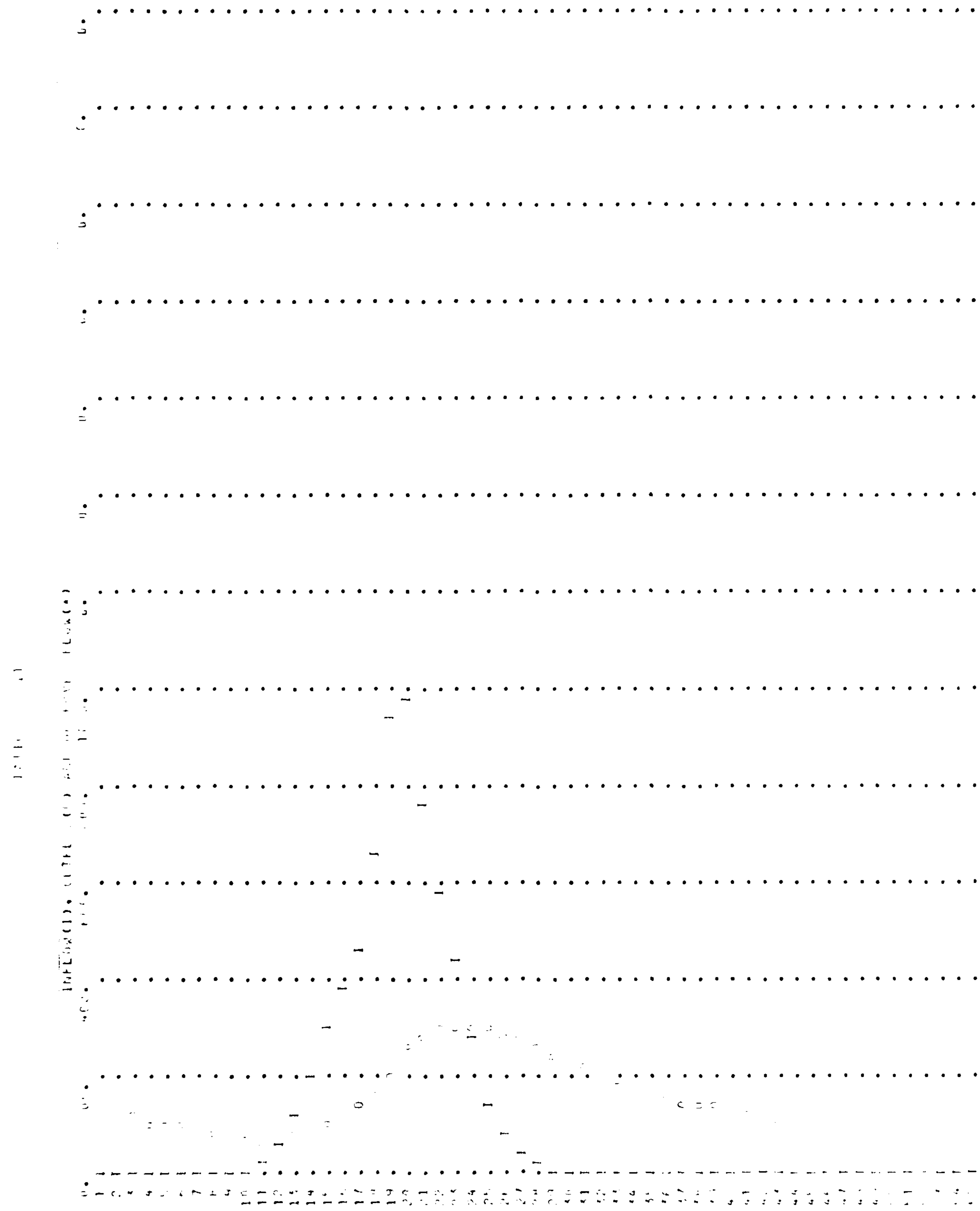
D-47

N.S. 25.

N.S.26

[illegible]	[illegible]	[illegible]	117.
[illegible]	[illegible]	[illegible]	110.
[illegible]	[illegible]	[illegible]	105.
[illegible]	[illegible]	[illegible]	97.
[illegible]	[illegible]	[illegible]	91.
[illegible]	[illegible]	[illegible]	86.
[illegible]	[illegible]	[illegible]	81.
[illegible]	[illegible]	[illegible]	78.
[illegible]	[illegible]	[illegible]	73.
[illegible]	[illegible]	[illegible]	67.
[illegible]	[illegible]	[illegible]	65.
[illegible]	[illegible]	[illegible]	60.
[illegible]	[illegible]	[illegible]	56.
[illegible]	[illegible]	[illegible]	53.
[illegible]	[illegible]	[illegible]	50.
[illegible]	[illegible]	[illegible]	47.
[illegible]	[illegible]	[illegible]	44.
[illegible]	[illegible]	[illegible]	41.
[illegible]	[illegible]	[illegible]	39.
[illegible]	[illegible]	[illegible]	37.
[illegible]	[illegible]	[illegible]	35.
[illegible]	[illegible]	[illegible]	32.
[illegible]	[illegible]	[illegible]	31.
[illegible]	[illegible]	[illegible]	29.
[illegible]	[illegible]	[illegible]	27.
[illegible]	[illegible]	[illegible]	25.
[illegible]	[illegible]	[illegible]	24.
[illegible]	[illegible]	[illegible]	23.
[illegible]	[illegible]	[illegible]	21.
[illegible]	[illegible]	[illegible]	20.
[illegible]	[illegible]	[illegible]	19.
[illegible]	[illegible]	[illegible]	18.
[illegible]	[illegible]	[illegible]	17.
[illegible]	[illegible]	[illegible]	16.
[illegible]	[illegible]	[illegible]	15.
[illegible]	[illegible]	[illegible]	14.
[illegible]	[illegible]	[illegible]	13.
[illegible]	[illegible]	[illegible]	12.
[illegible]	[illegible]	[illegible]	12.
[illegible]	[illegible]	[illegible]	11.
[illegible]	[illegible]	[illegible]	10.
[illegible]	[illegible]	[illegible]	10.
[illegible]	[illegible]	[illegible]	9.
[illegible]	[illegible]	[illegible]	9.
[illegible]	[illegible]	[illegible]	8.
[illegible]	[illegible]	[illegible]	8.
[illegible]	[illegible]	[illegible]	7.
[illegible]	[illegible]	[illegible]	7.
[illegible]	[illegible]	[illegible]	6.
[illegible]	[illegible]	[illegible]	6.
[illegible]	[illegible]	[illegible]	6.
[illegible]	[illegible]	[illegible]	5.
[illegible]	[illegible]	[illegible]	5.
[illegible]	[illegible]	[illegible]	5.
[illegible]	[illegible]	[illegible]	4.
[illegible]	[illegible]	[illegible]	4.
[illegible]	[illegible]	[illegible]	4.
[illegible]	[illegible]	[illegible]	4.
[illegible]	[illegible]	[illegible]	4.
[illegible]	[illegible]	[illegible]	5.
[illegible]	[illegible]	[illegible]	5.

N.S 27



SUB-AREA RUNOFF COMPUTATION

INFLOW TO LAUREL

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
[illegible]	0	0	0	0	0	1

HYDROGRAPH DATA

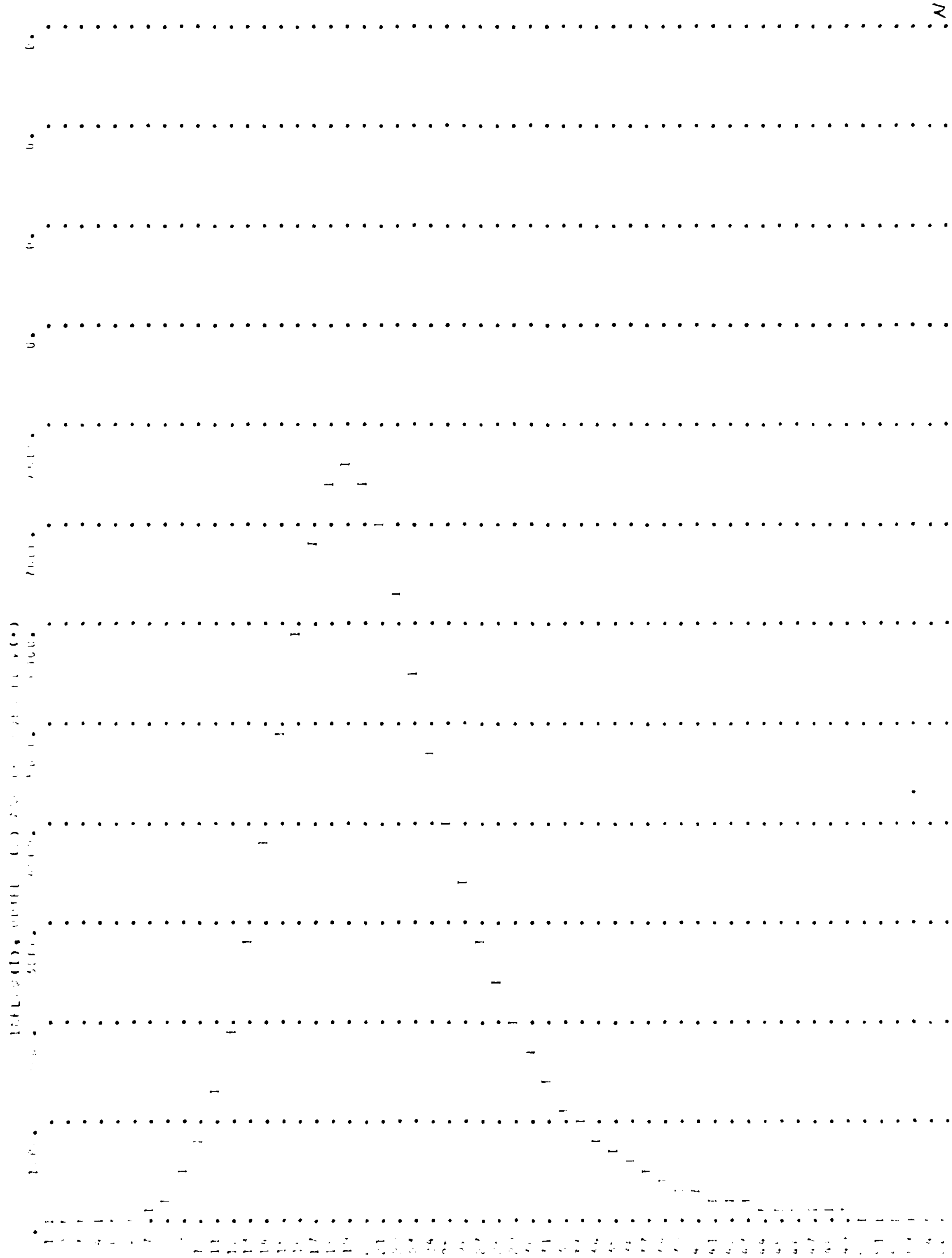
IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	-1	9.50	0.0	9.50	0.0	0.500	0	0	0

RUNOFF MULTIPLIED BY 0.50

[illegible]	8.	1.	3.	7.	34.	100.	234.	466.	813.
1.8[illegible].	[illegible]45.	2884.	[illegible]795.	4876.	5938.	6620.	7384.	7597.	7424.
[illegible]961.	[illegible]800.	[illegible]44.	4745.	40[illegible].	5595.	2843.	[illegible]77.	1988.	1666.
17[illegible].	1149.	9[illegible].	[illegible].	[illegible].	565.	480.	402.	332.	282.
[illegible].	198.	16[illegible].	14[illegible].	11[illegible].	97.	78.	64.	52.	[illegible].
2[illegible].	14.	[illegible].	[illegible].	[illegible].	0.	0.	0.	0.	0.
[illegible].	0.	0.	0.	[illegible].	0.	[illegible].	[illegible].	[illegible].	0.
[illegible].	0.	0.	0.	0.	0.	0.	0.	[illegible].	0.
[illegible].	0.	[illegible].	0.	0.	0.	0.	0.	0.	0.
[illegible].	0.	[illegible].	[illegible].	[illegible].	0.	[illegible].	0.	0.	0.
[illegible].	0.	[illegible].	[illegible].	[illegible].	0.	0.	0.	0.	0.
[illegible].	0.	0.	[illegible].	[illegible].	0.	[illegible].	[illegible].	0.	0.
[illegible].	0.	[illegible].	0.	[illegible].	0.	[illegible].	0.	0.	0.
[illegible].	[illegible].	[illegible].	0.	[illegible].	0.	0.	0.	0.	0.
[illegible].	0.	[illegible].	0.	[illegible].	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7[illegible]7.	[illegible]1.	[illegible].	[illegible].	[illegible]9.
INCHES		[illegible]	[illegible].13	8.13	[illegible]
AC-FT		[illegible].	4119.	4119.	4119.

NS 28



[illegible] HYDROGRAPH

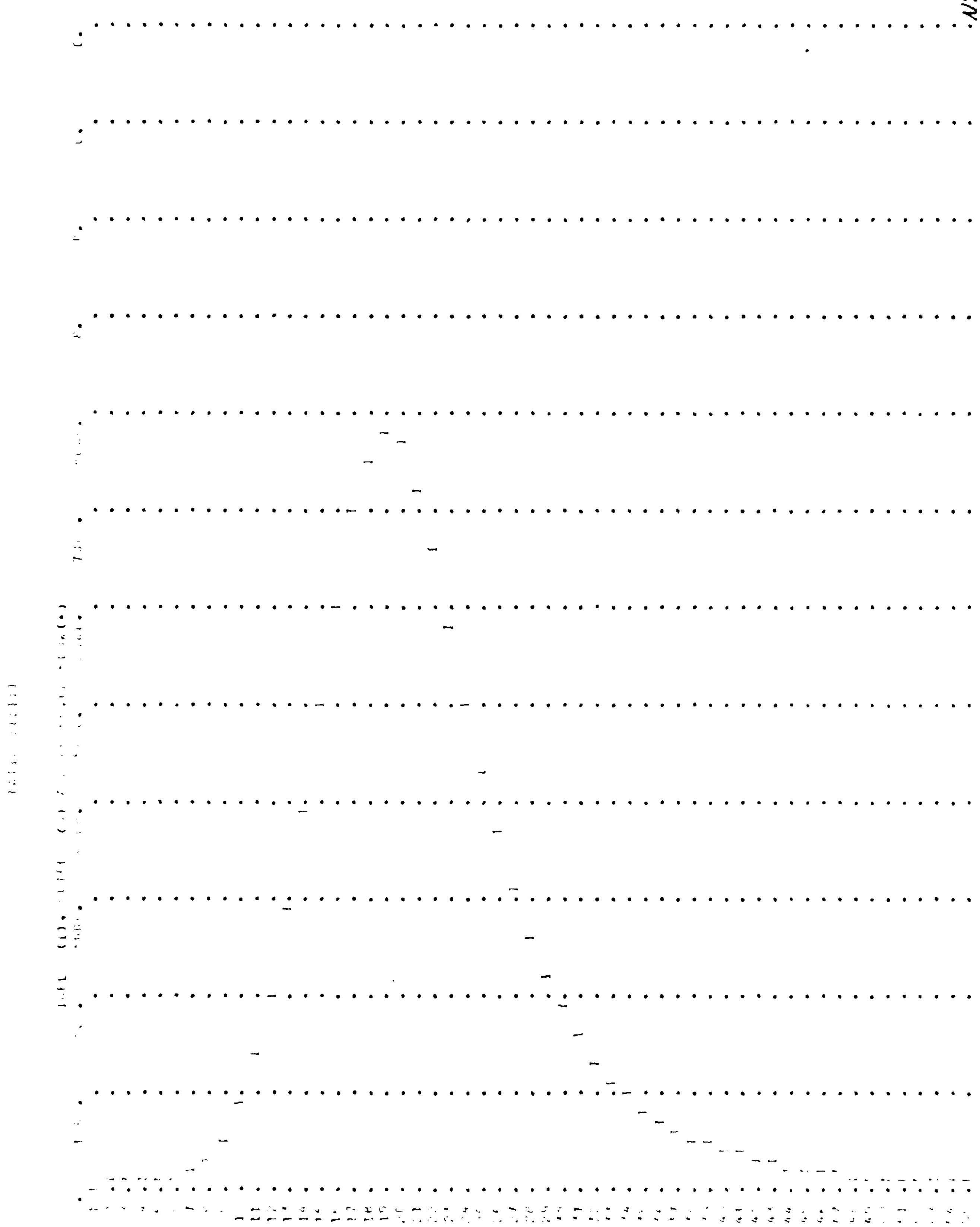
[illegible] TRI
111111 [illegible]

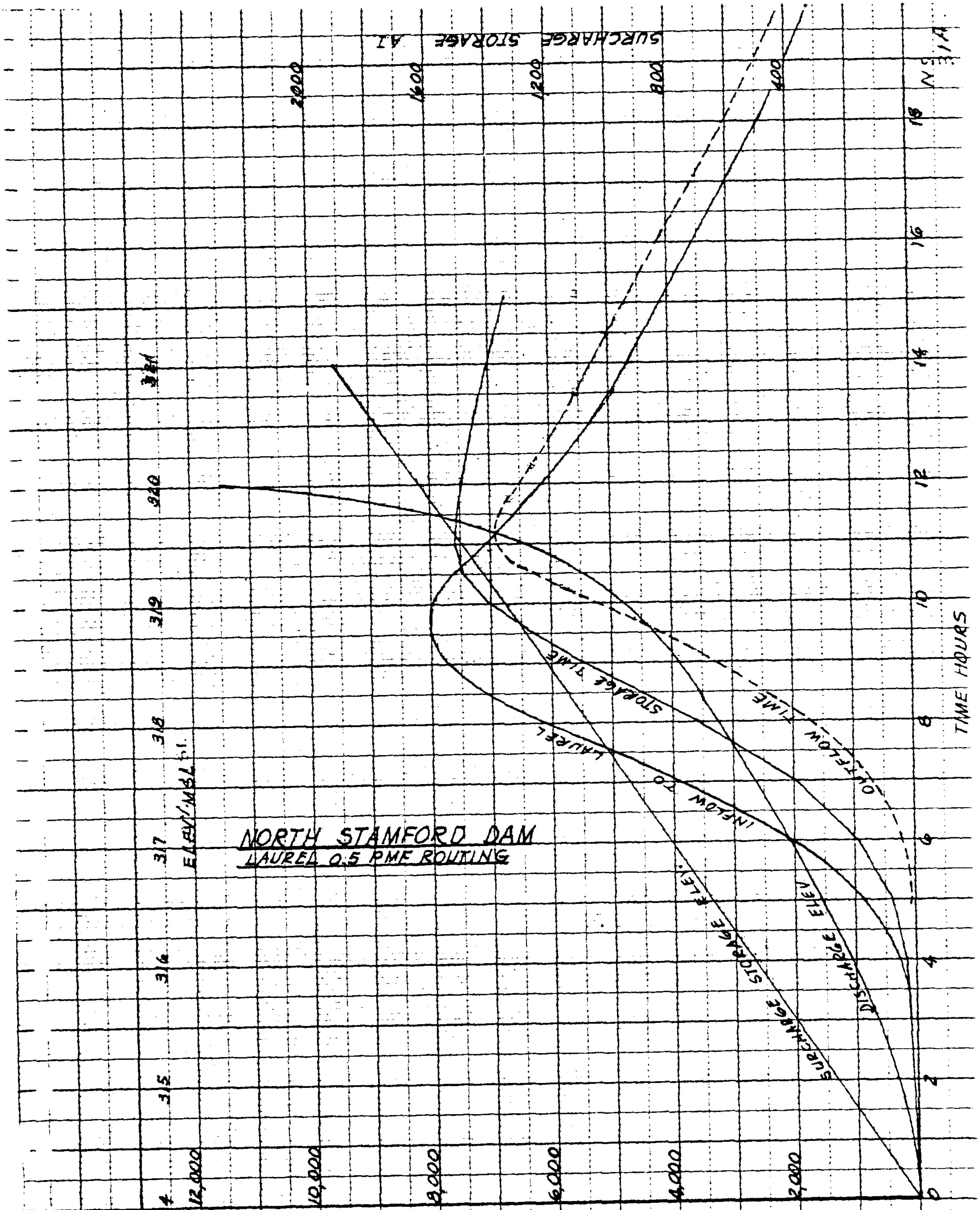
[illegible] ATIIIIII

[illegible]	117.	11[illegible].	10[illegible].	[illegible]	12[illegible].	1[illegible].	[illegible]1[illegible].	542.	[illegible]
13[illegible].	1[illegible].	[illegible]	[illegible]74.	[illegible]	[illegible]4[illegible].	[illegible]1.	7[illegible]4[illegible].	78[illegible].	7[illegible]7[illegible].
[illegible]	[illegible]01.	[illegible]4[illegible].	[illegible]	[illegible]1.	[illegible]1.	3114.	[illegible]	[illegible]22[illegible].	1[illegible]77.
1[illegible].	1[illegible].	11[illegible].	[illegible]	[illegible]	7[illegible]7.	[illegible]	[illegible]4[illegible].	4[illegible]3.	4[illegible].
[illegible]	[illegible]	[illegible]	[illegible]7.	[illegible]	1[illegible]5.	1[illegible]9.	14[illegible].	124.	1[illegible].
9[illegible].	74.	[illegible]	[illegible]	[illegible]	47.	44.	41.	3[illegible].	37.
5[illegible].	[illegible]	[illegible]1.	[illegible]	7.	[illegible]	[illegible]4.	[illegible]	21.	[illegible]0.
1[illegible].	18.	17.	1[illegible].	1[illegible].	14.	1[illegible].	1[illegible].	1[illegible].	11.
1[illegible].	1[illegible].	[illegible]	[illegible]	[illegible]	8.	7.	7.	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.	4.	4.	3.	[illegible]
[illegible]	4.	[illegible]	[illegible]	[illegible]	2.	2.	2.	2.	2.
[illegible]	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.	[illegible]	0.	0.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6.	0.	[illegible]	[illegible]	[illegible]

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7[illegible].	[illegible]	[illegible]7.	7[illegible]1.	10[illegible]119.
INCHES		[illegible]	[illegible].19	8.28	[illegible]
AC-FT		[illegible]7.	[illegible]	447[illegible].	4478.

NS 31




NORTH STAMFORD DAM
LAUREL 0.5 PMF ROUTING
SURCHARGE STORAGE AI
2000
1600
1200
800
400
TIME HOURS
0
2
4
6
8
10
12
14
16
18
DISCHARGES CFS
12,000
10,000
8,000
6,000
4,000
2,000
ELEV. MSL
314
315
316
317
318
319
320
INFLOW TO LAUREL
STORAGE TIME
OUTFLOW TIME
SURCHARGE STORAGE ELEV.
SURCHARGE DISCHARGE ELEV.

SUB-AREA RUNOFF COMPUTATION

INFLOW TO NORTH STAMFORD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
4	0	1	[illegible]	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
[illegible]	-1	9.[illegible]	[illegible]	9.[illegible]	0.0	0.500	0	[illegible]	0

PRECIP DATA

RUNOFF MULTIPLIED BY 0.50

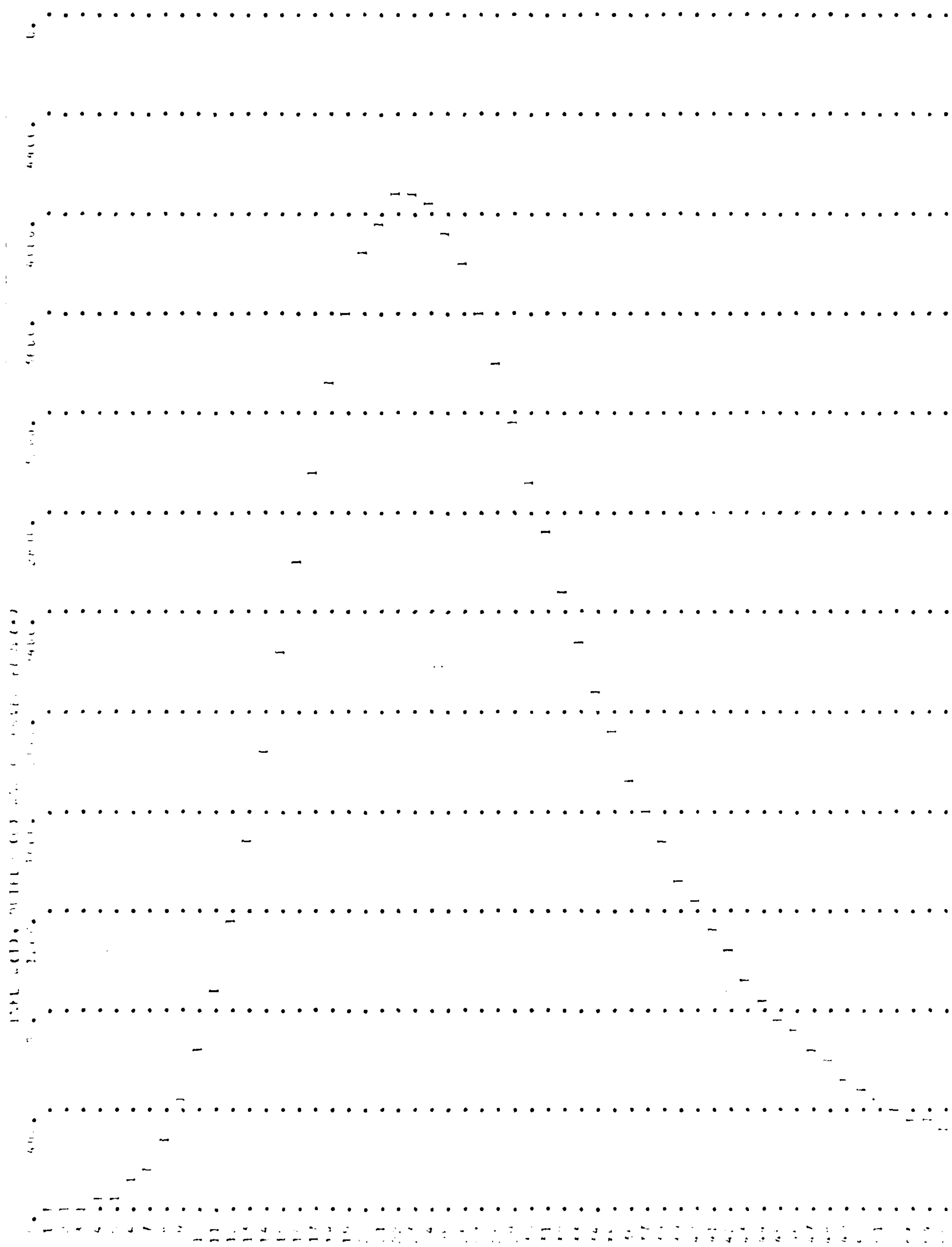
1.	4.	1[illegible].	[illegible]	[illegible]	107.	17[illegible].	[illegible]	450.	[illegible]27.
[illegible]	1166.	1497.	1[illegible]39.	[illegible]	2504.	2972.	[illegible]	3597.	3723.
[illegible]	[illegible]71.	4098.	[illegible]	[illegible]	3786.	3661.	[illegible]	5157.	2946.
[illegible]711.	[illegible]486.	2276.	[illegible]	19[illegible]7.	17[illegible]6.	1599.	14[illegible]5.	1336.	1227.
1124.	1[illegible]23.	97[illegible].	[illegible]	77[illegible].	766.	64[illegible].	[illegible]84.	533.	488.
447.	409.	377.	[illegible]4[illegible].	[illegible]	293.	270.	[illegible]	226.	[illegible]
187.	171.	156.	14[illegible].	1[illegible].	117.	104.	89.	77.	64.
5[illegible].	24.	16.	0.	4.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	[illegible]	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	[illegible]	[illegible]	[illegible]	0.	0.	0.	0.	0.
[illegible]	0.	[illegible]	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	[illegible]	0.	0.	0.	0.	0.

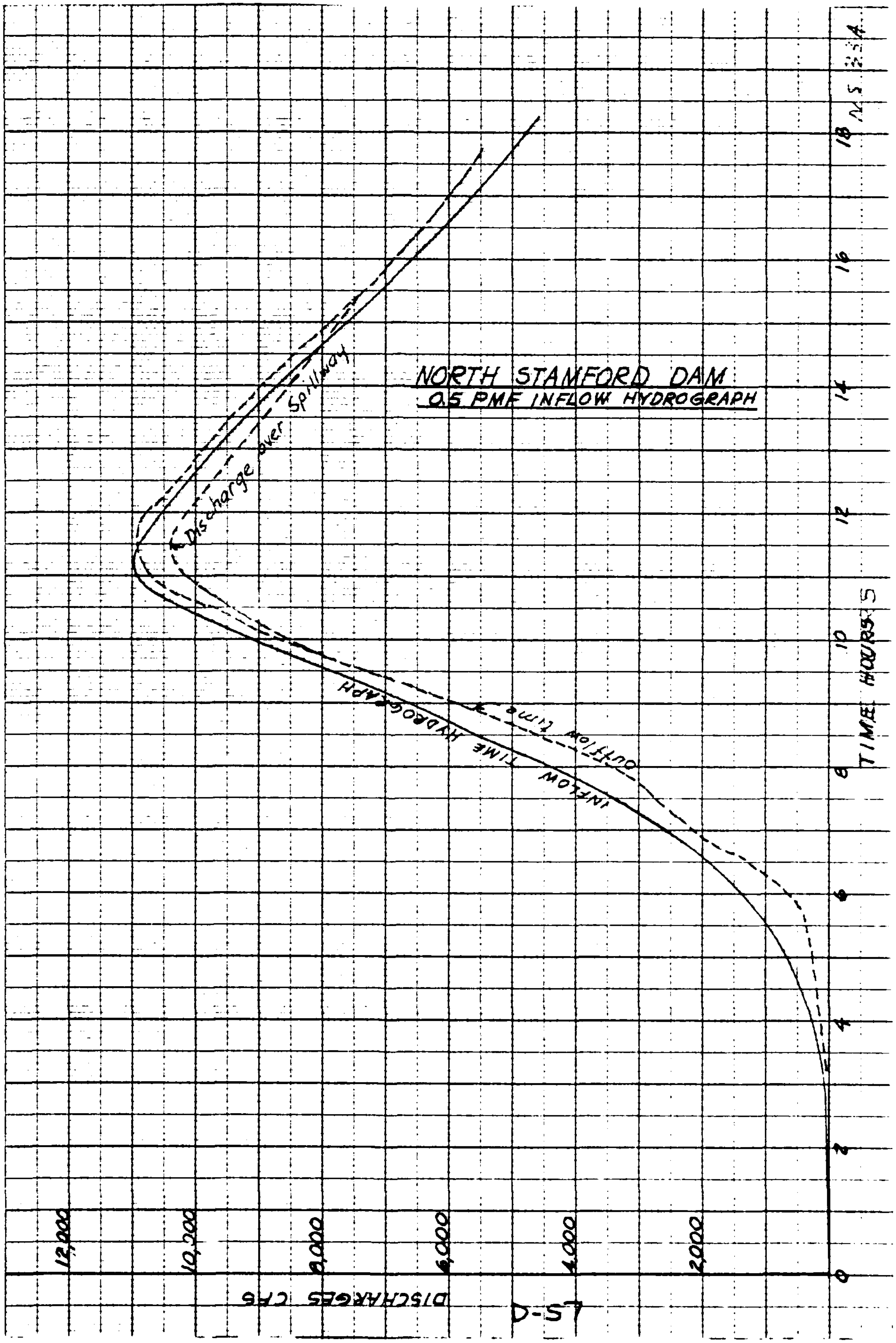
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	409[illegible].	3751.	1[illegible].	650.	[illegible]
INCHES		[illegible]	7.[illegible]	8.[illegible]	[illegible]
AC-FT		1[illegible]1.	[illegible]767.	3869.	38[illegible].

NS32

D-55

NS33




NORTH STAMFORD DAM
0.5 PMF INFLOW HYDROGRAPH
Discharge over spillway
INFLOW TIME HYDROGRAPH
outflow time
TIME HOURS
DISCHARGES CFS
0
2,000
4,000
6,000
8,000
10,000
12,000
2
4
6
8
10
12
14
16
18

0.35 PMF.

```
******************************
HEC-1 VERSION [illegible] JAN 1973
[illegible]
CHANGE NO. 1
******************************
          [illegible] STAMFORD DAM INSPECTION
          BY [illegible] MOLLIGAN
          JANUARY 1979

                     JOB SPECIFICATION
      NQ   NHR   NMIN  IDAY   IHR  IMIN METRC  IPLT  IPRT NSTAN
     150   [illegible]  [illegible]  [illegible]  0  0  0  2  0  [illegible]
                    JOPER    NWT
                      [illegible]   0

**********      **********      **********      **********      **********

                  SUB-AREA RUNOFF COMPUTATION

   INFLOW TO MILL RESERVOIR
            ISTAQ   ICOMP   IECON   ITAPE   JPLT   JPRT   INAME
              1       0       0       0      0      0      1

                          HYDROGRAPH DATA
   IHYDG   IUHG   TAREA   SNAP   TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
     [illegible]  -1   4.07   0.0   4.07   0.0   0.350   0   0   0

                          PRECIP DATA
                   NP   STORM    DAJ    DAK
                   12    0.0     0.0    0.0
                         PRECIP PATTERN
 [illegible]   0.40   0.[illegible]   1.07   1.16   1.34   1.70   4.94   1.16   1.16
 [illegible]   0.80

                            LOSS DATA
   LROPT  STRKR  DLTKR  RTIOL  ERAIN  STRKS  RTIOK  STRTL  CNSTL  ALSMX  RTIMP
   0.0    0.0    1.00   0.0    0.0    1.00   0.0    0.0    0.0    0.0

                 GIVEN UNIT GRAPH, NUHGQ=  [illegible]
 [illegible]   0.   [illegible]   0.   0.   0.   0.   0.   0.   0.
 [illegible]   17.  [illegible]  [illegible]  1[illegible]  141.  190.  [illegible]  253.  302.
 [illegible]  [illegible]  32[illegible]  [illegible]  [illegible]  265.  241.  [illegible]  189.  169.
 14[illegible]  1[illegible]  11[illegible]  10[illegible]  [illegible]  [illegible]  74.  [illegible]  58.  51.
 [illegible]  39.  [illegible]  31.  [illegible]  [illegible]  22.  [illegible]  16.  16.
 1[illegible]  1[illegible]  11.  10.  [illegible]  8.  7.  6.  5.  [illegible]
 [illegible]  4.  [illegible]  [illegible]  [illegible]  2.  [illegible]  2.  2.  1.
      UNIT GRAPH TOTALS  [illegible] CFS OR 1.01 INCHES OVER THE AREA

                          RECESSION DATA
          STRTQ=   0.0   QRCSN=   0.0   RTIOR=  1.00

                    END-OF-PERIOD FLOW
                 TIME   RAIN   EXCS   COMP Q
                   1    0.40   0.40     0.
                   2    0.40   0.40     0.
                   3    0.[illegible]   0.[illegible]     0.
                   4    1.07   1.07     0.
                   5    1.16   1.16     0.
```

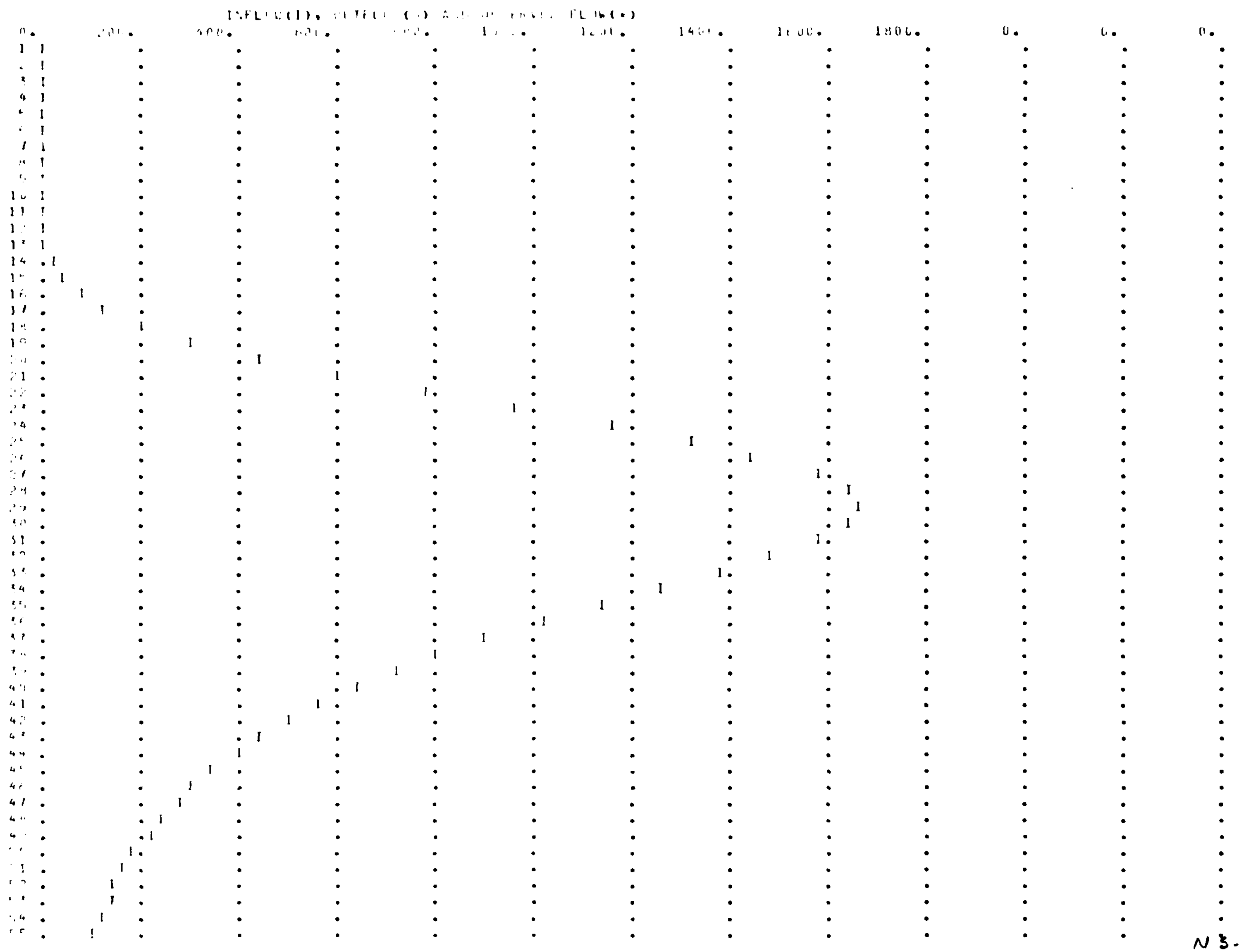
N.S-34

[illegible] Y [illegible]

	0.	0.		0.	0.	0.	0.	0.	0.
1.	3.	[illegible]	21.	43.	76.	126.	264.	306.	441.
39[illegible].	77[illegible].	[illegible]	11[illegible]1.	13[illegible]1.	1444.	1576.	1639.	1656.	1651.
157[illegible].	1480.	1373.	1[illegible]55.	11[illegible].	1011.	903.	865.	713.	635.
563.	[illegible]01.	444.	394.	3[illegible]1.	309.	273.	240.	213.	165.
16[illegible].	150.	133.	119.	10[illegible].	95.	85.	75.	66.	59.
5[illegible].	47.	4[illegible].	37.	3[illegible].	28.	2[illegible].	22.	20.	17.
1[illegible].	14.	11.	10.	[illegible]	7.	[illegible]	2.	2.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1656.	1435.	613.	207.	29781.
INCHES		3.28	5.61	5.67	5.67
AC-FT		712.	1217.	1231.	1231.

N.S.35



N3-36

*********** *********** *********** *********** ***********

HYDROGRAPH ROUTING

ROUTING THROUGH MILL RESERVOIR

	ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
	1111	1	0	0	2	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE	[illegible]	132.	204.	279.	359.	443.	533.	631.	739.	863.
OUTFLOW	[illegible]	967.	1855.	2952.	4249.	5732.	7400.	9209.	11070.	12961.

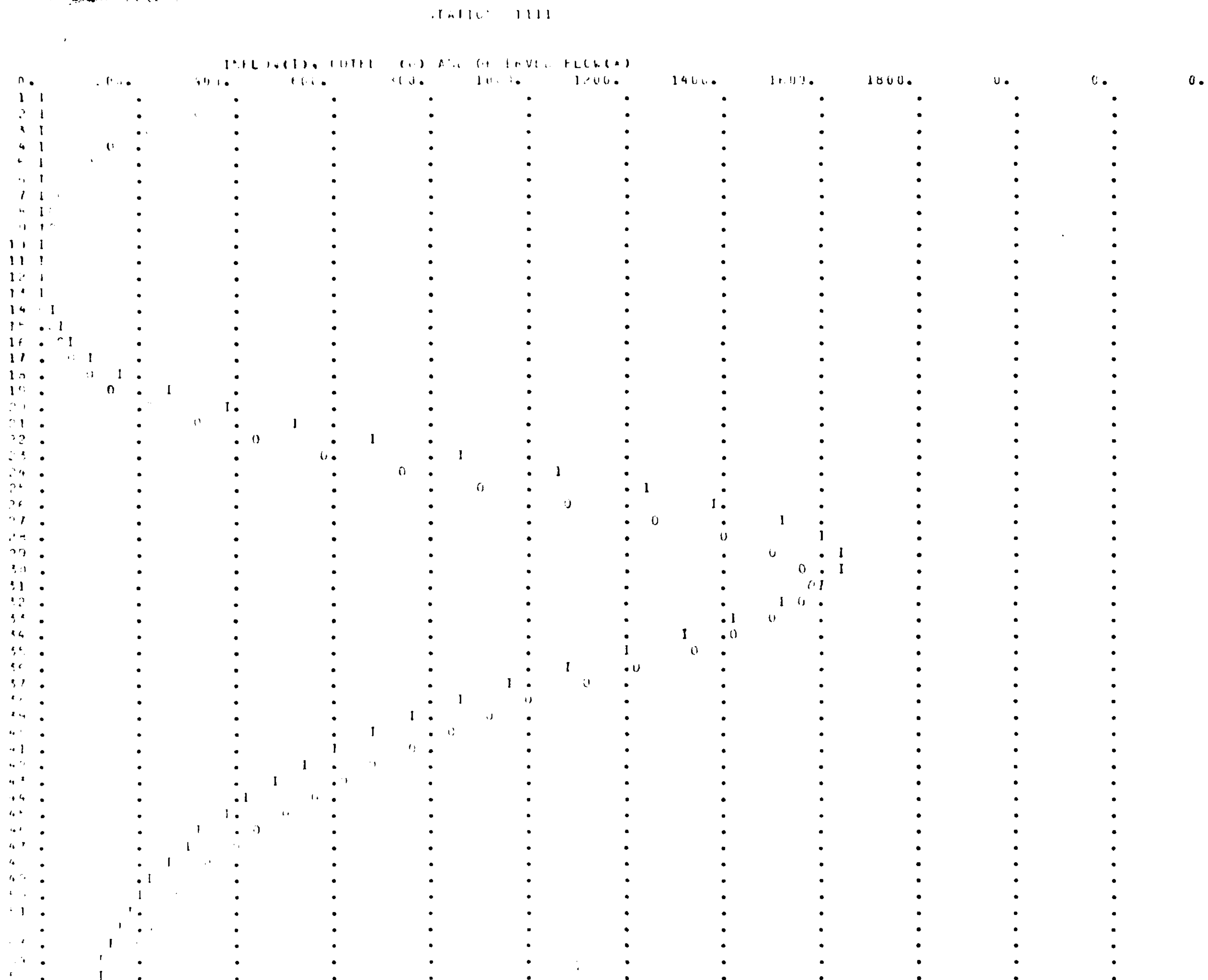
TIME	EOP STOR	AVG IN	EOP OUT
1	71.	0.	0.
2	64.	0.	523.
3	53.	0.	217.
4	45.	0.	146.
5	40.	0.	98.
6	37.	0.	66.
7	35.	0.	44.
8	33.	0.	30.
9	32.	0.	20.
10	31.	0.	14.
11	31.	0.	9.
12	31.	2.	7.
13	31.	6.	7.
14	31.	15.	9.
15	32.	32.	17.
16	34.	61.	31.
17	36.	103.	55.
18	40.	166.	91.
19	45.	254.	144.
20	53.	374.	219.
21	63.	514.	317.
22	76.	682.	437.
23	91.	864.	577.
24	107.	1055.	733.
25	125.	1236.	898.
26	141.	1382.	1076.
27	155.	1511.	1253.
28	167.	1608.	1397.
29	175.	1648.	1499.
30	180.	1644.	1558.
31	181.	1601.	1576.
32	180.	1526.	1555.
33	175.	1425.	1503.
34	169.	1312.	1425.
35	161.	1193.	1331.
36	153.	1073.	1225.
37	144.	957.	1116.
38	135.	853.	1009.
39	127.	759.	919.

N.S. 37

N.S-38

[illegible]	116.	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	616.
[illegible]	[illegible]	417.	551.
[illegible]	[illegible]	372.	[illegible]
[illegible]	[illegible]	329.	459.
[illegible]	71.	291.	391.
[illegible]	[illegible]	[illegible]	347.
[illegible]	62.	226.	307.
[illegible]	[illegible]	201.	272.
[illegible]	[illegible]	176.	242.
[illegible]	[illegible]	[illegible]	214.
[illegible]	[illegible]	142.	191.
[illegible]	[illegible]	126.	169.
[illegible]	[illegible]	113.	151.
[illegible]	44.	101.	134.
[illegible]	[illegible]	[illegible]	120.
[illegible]	41.	[illegible]	107.
[illegible]	[illegible]	71.	[illegible]
[illegible]	[illegible]	63.	84.
[illegible]	[illegible]	56.	75.
[illegible]	7.	[illegible]	67.
[illegible]	[illegible]	44.	60.
[illegible]	[illegible]	[illegible]	53.
[illegible]	[illegible]	[illegible]	47.
[illegible]	[illegible]	[illegible]	42.
[illegible]	[illegible]	27.	37.
[illegible]	[illegible]	24.	33.
[illegible]	[illegible]	21.	29.
[illegible]	[illegible]	[illegible]	26.
[illegible]	[illegible]	17.	23.
[illegible]	[illegible]	[illegible]	20.
[illegible]	[illegible]	13.	18.
[illegible]	[illegible]	11.	[illegible]
[illegible]	[illegible]	9.	13.
[illegible]	[illegible]	[illegible]	12.
[illegible]	[illegible]	[illegible]	10.
[illegible]	[illegible]	4.	8.
[illegible]	[illegible]	2.	6.
[illegible]	[illegible]	1.	4.
[illegible]	[illegible]	1.	[illegible]
[illegible]	[illegible]	0.	2.
[illegible]	[illegible]	[illegible]	1.
[illegible]	[illegible]	0.	1.
[illegible]	[illegible]	[illegible]	1.
[illegible]	[illegible]	[illegible]	0.
[illegible]	[illegible]	[illegible]	0.
[illegible]	[illegible]	0.	0.
[illegible]	[illegible]	[illegible]	0.
[illegible]	[illegible]	[illegible]	0.
[illegible]	[illegible]	[illegible]	0.
[illegible]	[illegible]	[illegible]	0.
[illegible]	[illegible]	[illegible]	0.
[illegible]	[illegible]	0.	0.
[illegible]	[illegible]	[illegible]	0.
[illegible]	[illegible]	0.	0.
[illegible]	[illegible]	0.	0.
[illegible]	[illegible]	[illegible]	0.
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	0.	0.

N.S. 39



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SUB-AREA RUNOFF COMPUTATION

INFLOW TO TRINITY

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
[illegible]	[illegible]	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
[illegible]	-1	[illegible]	0.0	[illegible]	0.0	0.350	0	0	0

PRECIP DATA

NP	STORM	DAJ	DAK
1.	0.0	0.0	0.0

PRECIP PATTERN

0.40	0.40	0.89	1.07	1.16	1.54	1.70	4.94	1.16	1.16
0.96	0.88								

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.0	0.0	1.00	0.0	0.0	1.00	0.0	0.0	0.0	0.0

GIVEN UNIT GRAPH, NUHGQ= 20

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
12[illegible].	700.	196.	96.	47.	23.	11.	5.	3.	1.

UNIT GRAPH TOTALS 813. CFS OR 1.02 INCHES OVER THE AREA

RECESSION DATA

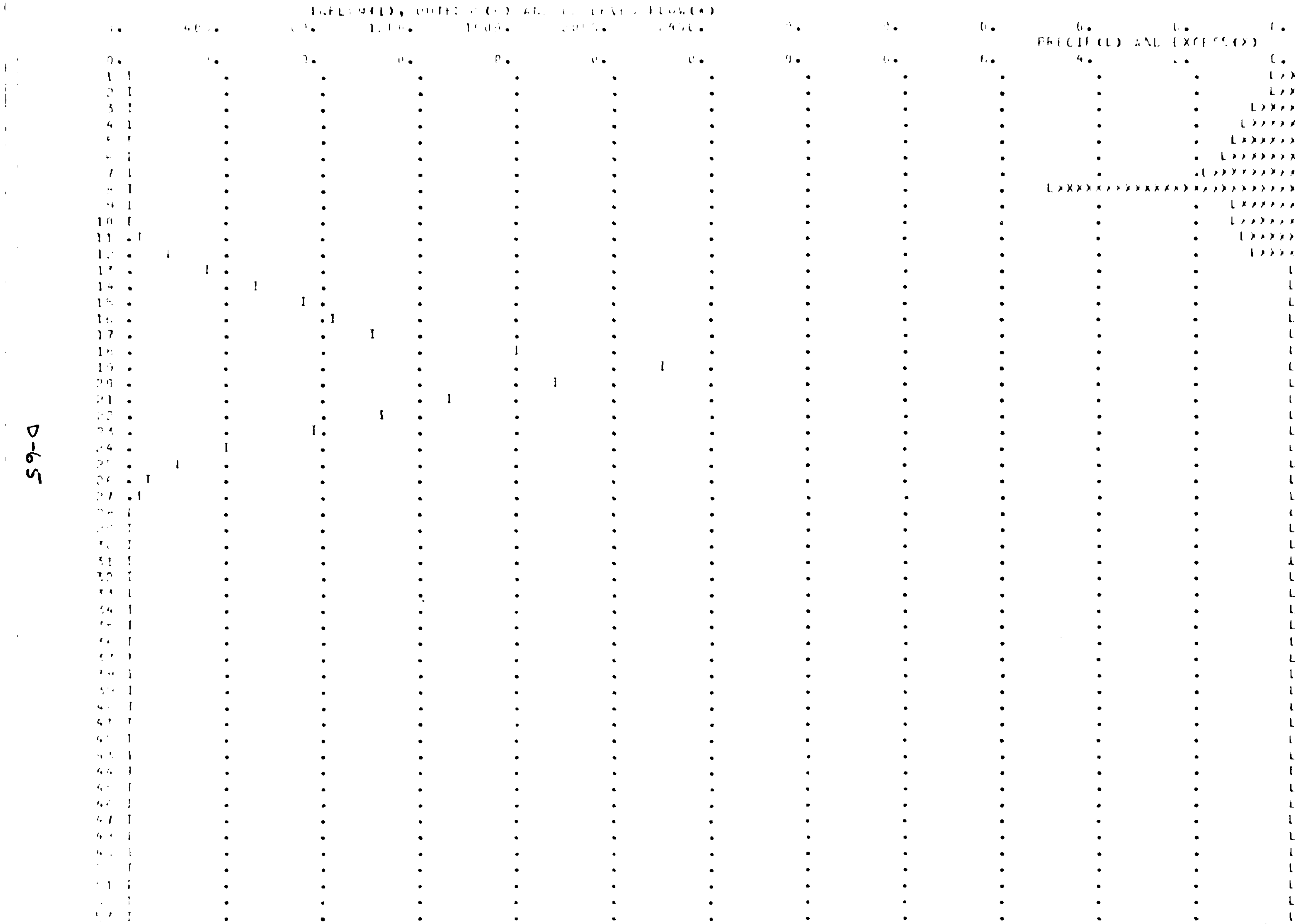
STRTQ= 0.0 QRCSN= 0.0 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.40	0.40	0.
2	0.40	0.40	0.
3	0.89	0.89	0.
4	1.07	1.07	0.
5	1.16	1.16	0.
6	1.54	1.54	0.
7	1.70	1.70	0.
8	4.94	4.94	0.
9	1.16	1.16	0.
10	1.16	1.16	0.
11	.96	[illegible]	52.
12	0.88	0.88	172.
13	0.0	0.0	314.
14	0.0	0.0	523.
15	0.0	0.0	704.
16	0.0	0.0	846.
17	0.0	0.0	1009.
18	0.0	0.0	1601.
19	0.0	0.0	2189.
20	0.0	0.0	1744.
21	0.0	0.0	1510.
22	0.0	0.0	1654.
23	0.0	0.0	745.
24	0.0	0.0	402.

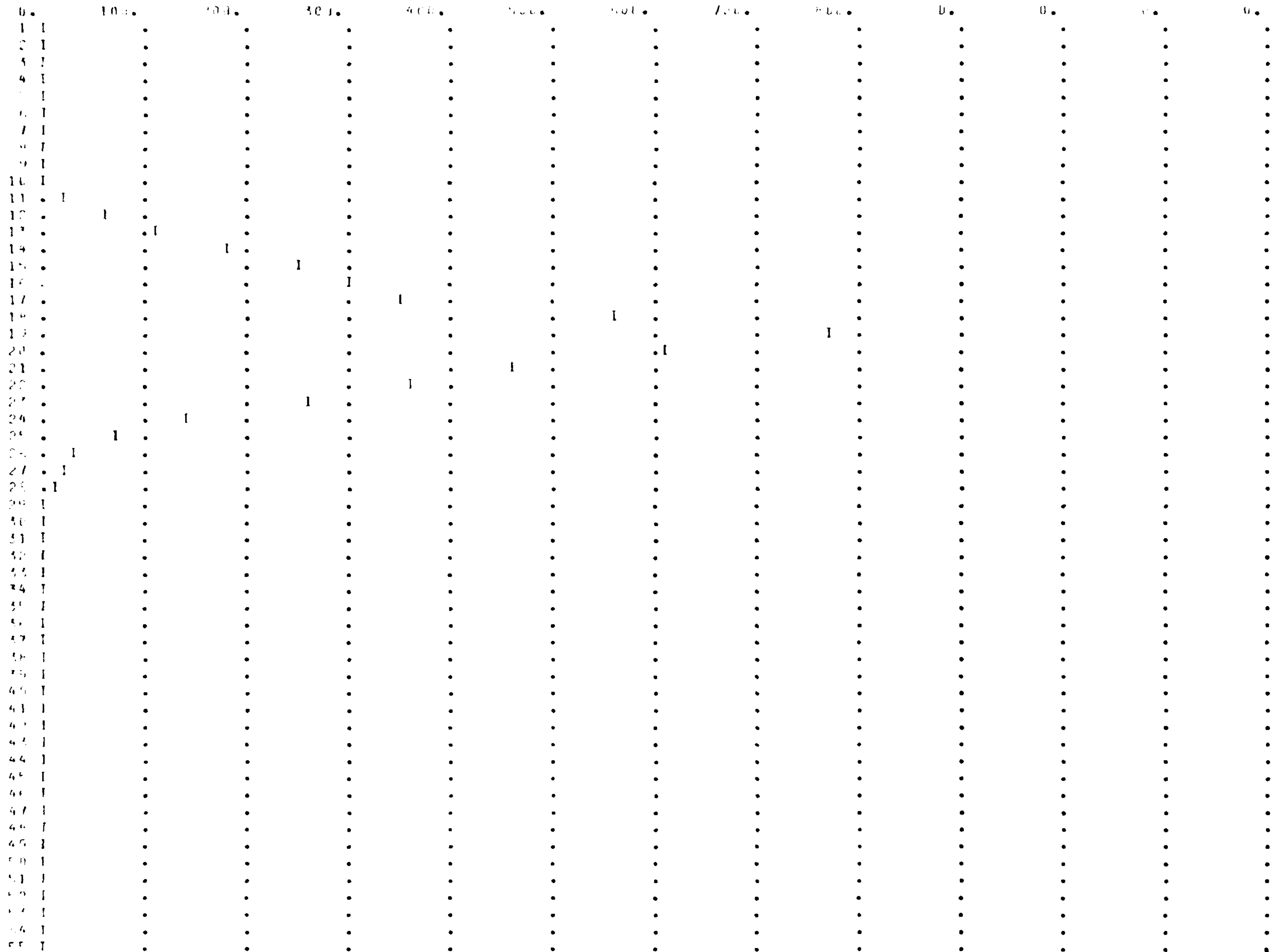
N.S-40

N.S-41



	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7?6.	[illegible]	95.	57.	4??3.
INCHES		?.44	?.?9	?.?9	[illegible]
AC-FT		180.	198.	198.	198.

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)



N.S-43

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HYDROGRAPH ROUTING

ROUTING THROUGH [illegible]

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
11	1	0	0	2	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE=	125.	253.	37[illegible].	502.	[illegible]	758.	887.	1017.	1148.	12[illegible].
OUTFLOW=	117.	301.	[illegible]	[illegible]	[illegible]1.	395.	[illegible]	405.	1295.	2914.

TIME	EOP STOR	AVG IN	EOP OUT
1	127.	0.	0.
2	125.	0.	117.
3	120.	0.	110.
4	116.	0.	104.
5	112.	0.	97.
6	108.	0.	92.
7	104.	0.	86.
8	101.	0.	81.
9	97.	0.	76.
10	94.	0.	72.
11	92.	9.	68.
12	91.	39.	66.
13	91.	85.	66.
14	[illegible]	146.	72.
15	1[illegible].	215.	81.
16	1[illegible].	271.	92.
17	117.	32[illegible].	106.
18	1[illegible]1.	457.	126.
19	1[illegible]5.	[illegible]	158.
20	174.	683.	189.
21	1[illegible].	5[illegible].	210.
22	1[illegible].	410.	22[illegible].
23	2[illegible].	311.	227.
24	1[illegible].	203.	22[illegible].
25	1[illegible]4.	164.	218.
26	1[illegible]7.	51.	208.
27	1[illegible].	24.	1[illegible]7.
28	172.	11.	186.
29	1[illegible].	5.	176.
30	1[illegible]8.	[illegible]	1[illegible]5.
31	1[illegible]1.	1.	1[illegible]6.
32	14[illegible].	0.	147.
33	1[illegible].	0.	138.
34	1[illegible].	0.	130.
35	1[illegible].	0.	122.
36	1[illegible]4.	0.	115.
37	11[illegible].	0.	108.
38	11[illegible].	0.	102.
39	111.	0.	96.

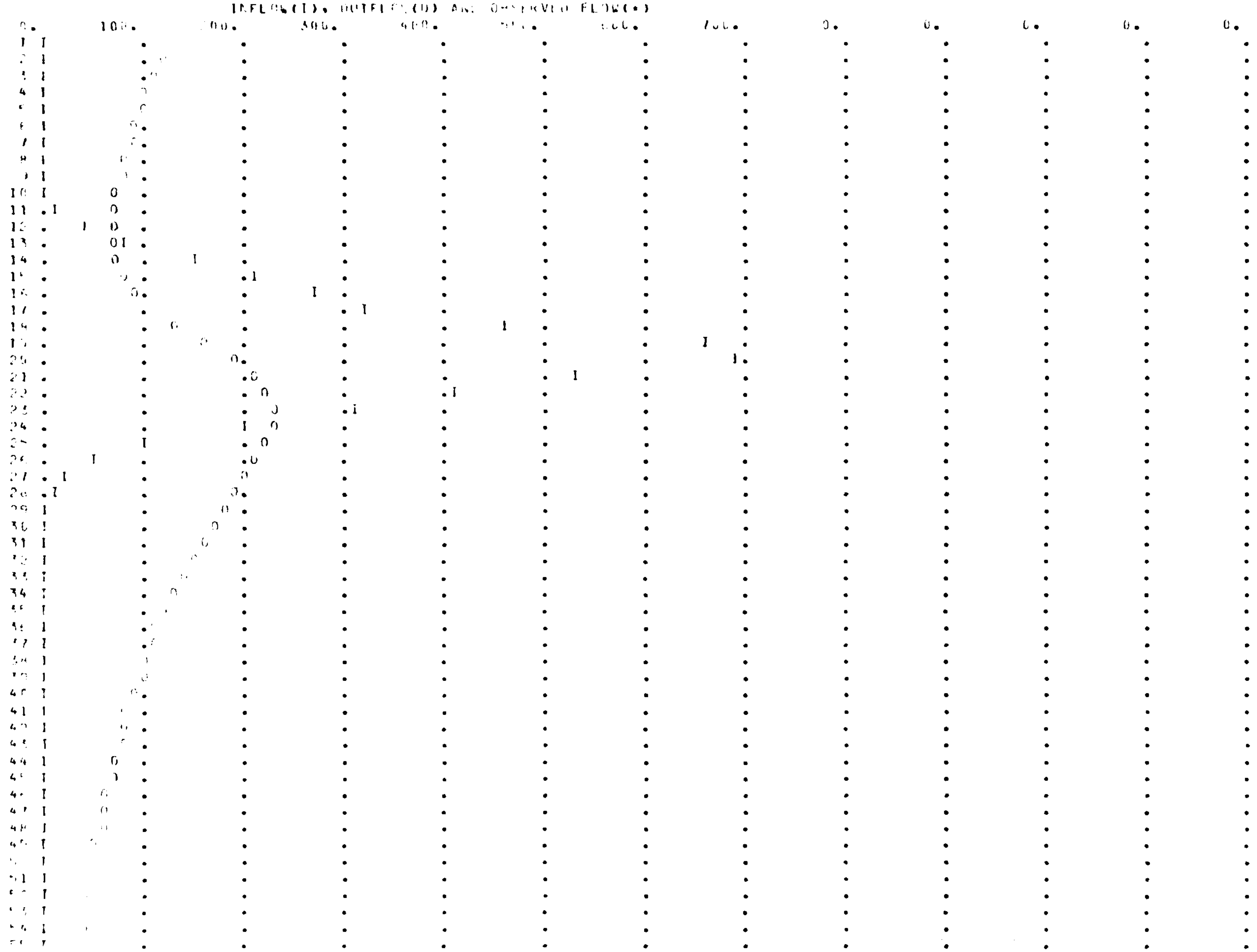
N.S-44

N.S-45

41	[illegible]	0.	95.
42	[illegible]	0.	90.
43	.	.	75.
44	93.	0.	71.
45	91.	0.	66.
46	88.	0.	63.
47	85.	0.	59.
48	83.	0.	55.
49	81.	0.	52.
50	79.	0.	49.
51	77.	0.	46.
52	75.	0.	43.
53	73.	0.	41.
54	72.	0.	38.
55	70.	0.	36.
56	69.	0.	34.
57	67.	0.	32.
58	66.	0.	30.
59	65.	0.	28.
60	64.	0.	27.
61	63.	0.	25.
62	62.	0.	24.
63	61.	0.	22.
64	60.	0.	21.
65	59.	0.	20.
66	58.	0.	19.
67	57.	0.	17.
68	57.	0.	16.
69	56.	0.	15.
70	55.	0.	15.
71	55.	0.	14.
72	54.	0.	13.
73	54.	0.	12.
74	53.	0.	11.
75	53.	0.	11.
76	52.	0.	10.
77	52.	0.	9.
78	52.	0.	9.
79	51.	0.	8.
80	51.	0.	8.
81	51.	0.	7.
82	50.	0.	7.
83	50.	0.	7.
84	50.	0.	6.
85	49.	0.	6.
86	49.	0.	5.
87	49.	0.	5.
88	49.	0.	5.
89	49.	0.	5.
90	48.	0.	4.
91	48.	0.	4.
92	48.	0.	4.
93	48.	0.	4.
94	48.	0.	3.
95	48.	0.	3.
96	48.	0.	3.
97	47.	0.	3.
98	47.	0.	3.
99	47.	0.	2.
100	47.	0.	2.

STATION 11

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)



N.S-46

*********** *********** *********** *********** ***********

COMBINE HYDROGRAPHS

COMBINE HYDROGRAPH WITH SUM OF ABOVE

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
0	2	0	0	0	0	1

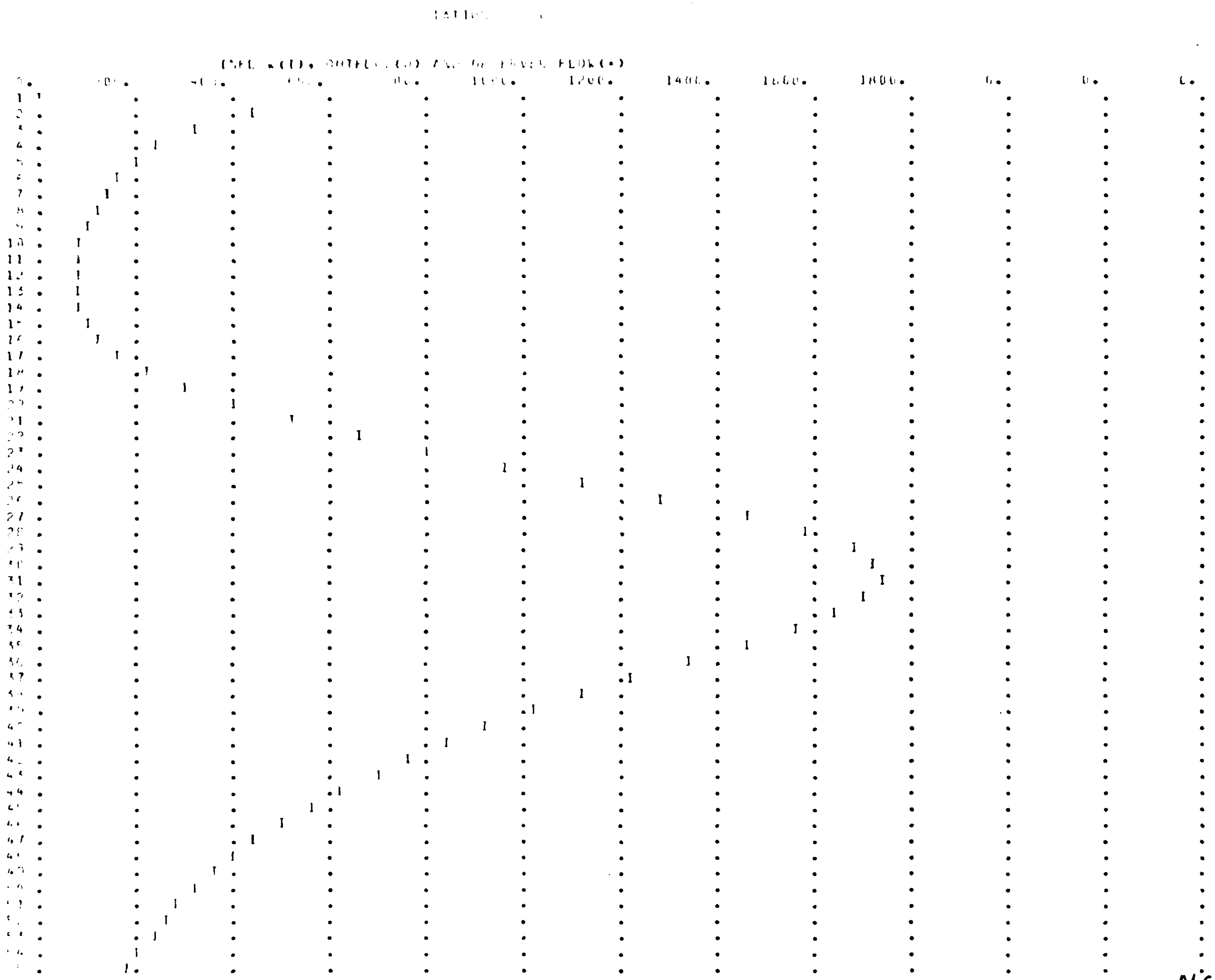
SUM OF 2 HYDROGRAPHS AT 0

[illegible]	440.	427.	[illegible]	19[illegible].	158.	131.	111.	97.	8[illegible].
77.	73.	74.	82.	98.	123.	150.	217.	303.	409.
[illegible]27.	658.	804.	958.	111[illegible].	128[illegible].	14[illegible]1.	1[illegible]84.	1675.	1724.
1731.	1702.	1640.	1[illegible]55.	14[illegible].	1346.	12[illegible].	1111.	1014.	929.
[illegible]	765.	691.	[illegible]22.	[illegible]	502.	449.	402.	359.	321.
[illegible]	258.	231.	[illegible].	1[illegible]7.	166.	15[illegible].	137.	125.	111.
100.	91.	8[illegible].	74.	[illegible]7.	60.	54.	49.	44.	40.
3[illegible].	[illegible]3.	30.	27.	24.	22.	1[illegible].	17.	14.	12.
11.	[illegible].	[illegible].	7.	[illegible].	[illegible].	[illegible].	5.	5.	4.
4.	4.	4.	[illegible].	[illegible].	3.	3.	3.	2.	2.
[illegible].	2.	[illegible].	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.
[illegible].	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible].	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1771.	15[illegible].	716.	259.	37300.
INCHES		3.0[illegible]	5.68	6.17	6.17
AC-FT		7[illegible].	1421.	1542.	1542.

N.S-47

N.S-48



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**********          **********          **********          **********          **********

                              SUB-AREA RUNOFF COMPUTATION

    INFLOW TO TANNEL
                ISTAQ   ICOMP   IECON   ITAPE   JPLT    JPRT    INAME
                  4       0       0       0       0       0       1

                                  HYDROGRAPH DATA
    IHYDG   IUHG    TAREA   SNAP    TRSDA   TRSPC   RATIO   ISNOW   ISAME   LOCAL
      0      -1     9.56    0.0     9.56    0.0     0.350     0       0       0

                                   PRECIP DATA
                           NP    STORM     DAJ      DAK
                           12     0.0      0.0      0.0
                                  PRECIP PATTERN
  0.40     0.40     0.89     1.07     1.16     1.34     1.70     4.94     1.16     1.16
  0.94     0.80

                                   LOSS DATA
    STRKR   DLTKR   RTIOL   ERAIN   STRKS   RTIOK   STRTL   CNSTL   ALSMX   RTIMP
     0.0     0.0    1.00     0.0     0.0    1.00     0.0     0.0     0.0     0.0

                          GIVEN UNIT GRAPH, NUHGQ=  44
    0.       0.       0.       0.      34.     135.     287.     454.     738.     954.
 1193.    1150.    1109.    1012.     877.     759.     623.     523.     439.     368.
  310.     259.     216.     176.     145.     122.     103.      86.      75.      64.
   55.      41.      36.      31.      26.      21.      18.      16.      13.      10.
    9.       8.       6.       5.
            UNIT GRAPH TOTALS  12455. CFS OR 1.02 INCHES OVER THE AREA

                                 RECESSION DATA
                  STRTQ=    0.0     QRCSN=    0.0     RTIOR= 1.00

                             END-OF-PERIOD FLOW
                        TIME   RAIN    EXCS      COMP Q
                          1    0.40    0.40         0.
                          2    0.40    0.40         0.
                          3    0.89    0.89         0.
                          4    1.07    1.07         0.
                          5    1.16    1.16        14.
                          6    1.34    1.34        63.
                          7    1.70    1.70       199.
                          8    4.94    4.94       469.
                          9    1.16    1.16       952.
                         10    1.16    1.16      1626.
                         11    0.94    0.94      2575.
                         12    0.80    0.80      3691.
                         13    0.0     0.0       5009.
                         14    0.0     0.0       7590.
                         15    0.0     0.0       9740.
                         16    0.0     0.0      11876.
                         17    0.0     0.0      13540.
                         18    0.0     0.0      14769.
                         19    0.0     0.0      15194.
                         20    0.0     0.0      14949.
                         21    0.0     0.0      13922.
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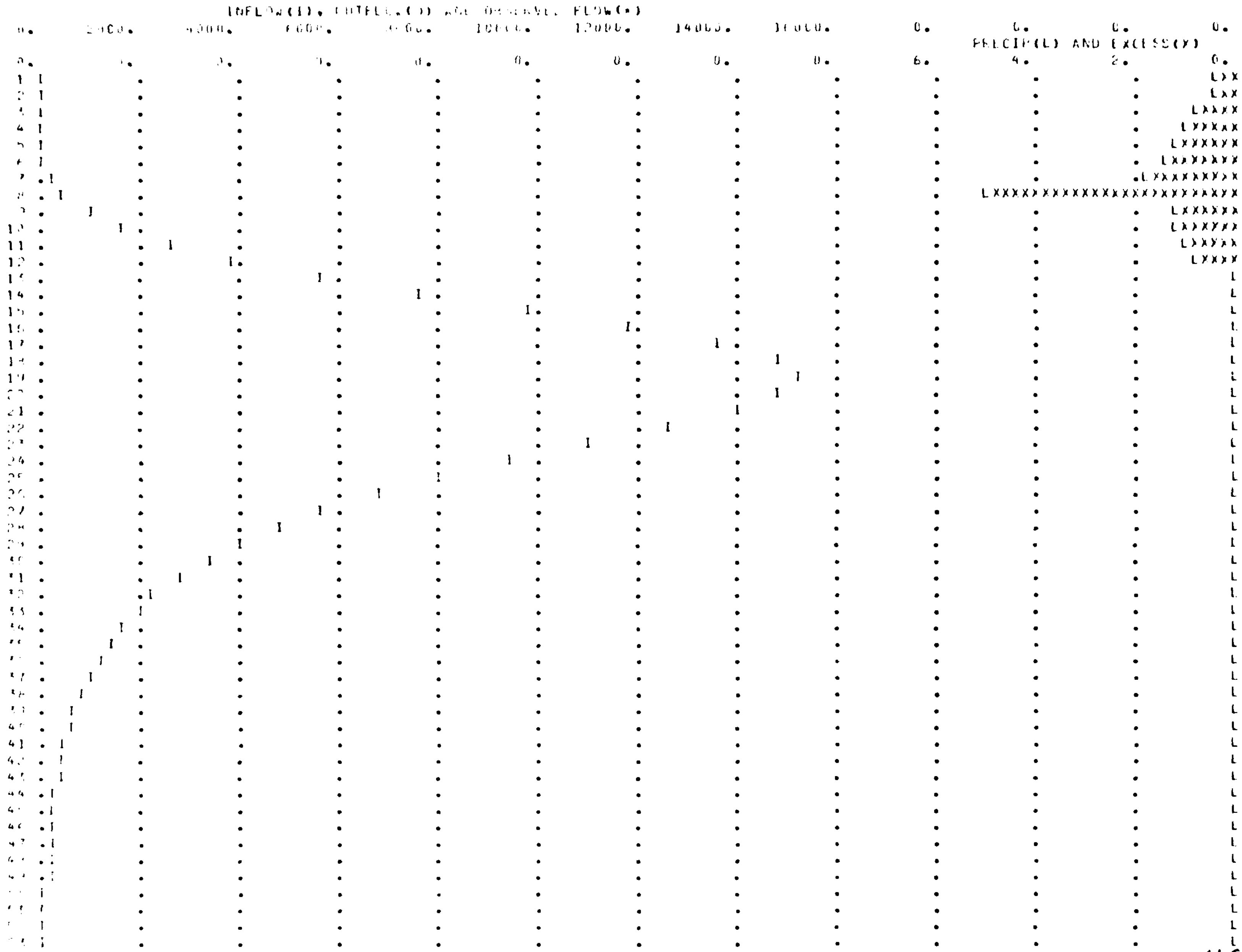
N.S-49

23	0.0	0.0	11683.
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	0.0	0.0	[illegible]
26	0.0	0.0	6739.
27	0.0	0.0	5696.
28	0.0	0.0	4754.
29	0.0	0.0	3975.
30	0.0	0.0	3320.
31	0.0	0.0	2764.
32	0.0	0.0	2295.
33	0.0	0.0	1920.
34	0.0	0.0	1607.
35	0.0	0.0	1344.
36	0.0	0.0	1130.
37	0.0	0.0	960.
38	0.0	0.0	804.
39	0.0	0.0	664.
40	0.0	0.0	564.
41	0.0	0.0	475.
42	0.0	0.0	397.
43	0.0	0.0	329.
44	0.0	0.0	280.
45	0.0	0.0	236.
46	0.0	0.0	194.
47	0.0	0.0	156.
48	0.0	0.0	129.
49	0.0	0.0	104.
50	0.0	0.0	78.
51	0.0	0.0	58.
52	0.0	0.0	28.
53	0.0	0.0	18.
54	0.0	0.0	10.
55	0.0	0.0	4.
56	0.0	0.0	0.
57	0.0	0.0	0.
58	0.0	0.0	0.
59	0.0	0.0	0.
60	0.0	0.0	0.
61	0.0	0.0	0.
62	0.0	0.0	0.
63	0.0	0.0	0.
64	0.0	0.0	0.
65	0.0	0.0	0.
66	0.0	0.0	0.
67	0.0	0.0	0.
68	0.0	0.0	0.
69	0.0	0.0	0.
70	0.0	0.0	0.
71	0.0	0.0	0.
72	0.0	0.0	0.
73	0.0	0.0	0.
74	0.0	0.0	0.
75	0.0	0.0	0.
76	0.0	0.0	0.
77	0.0	0.0	0.
78	0.0	0.0	0.
79	0.0	0.0	0.
80	0.0	0.0	0.
81	0.0	0.0	0.
82	0.0	0.0	0.

N.S-50

STATION



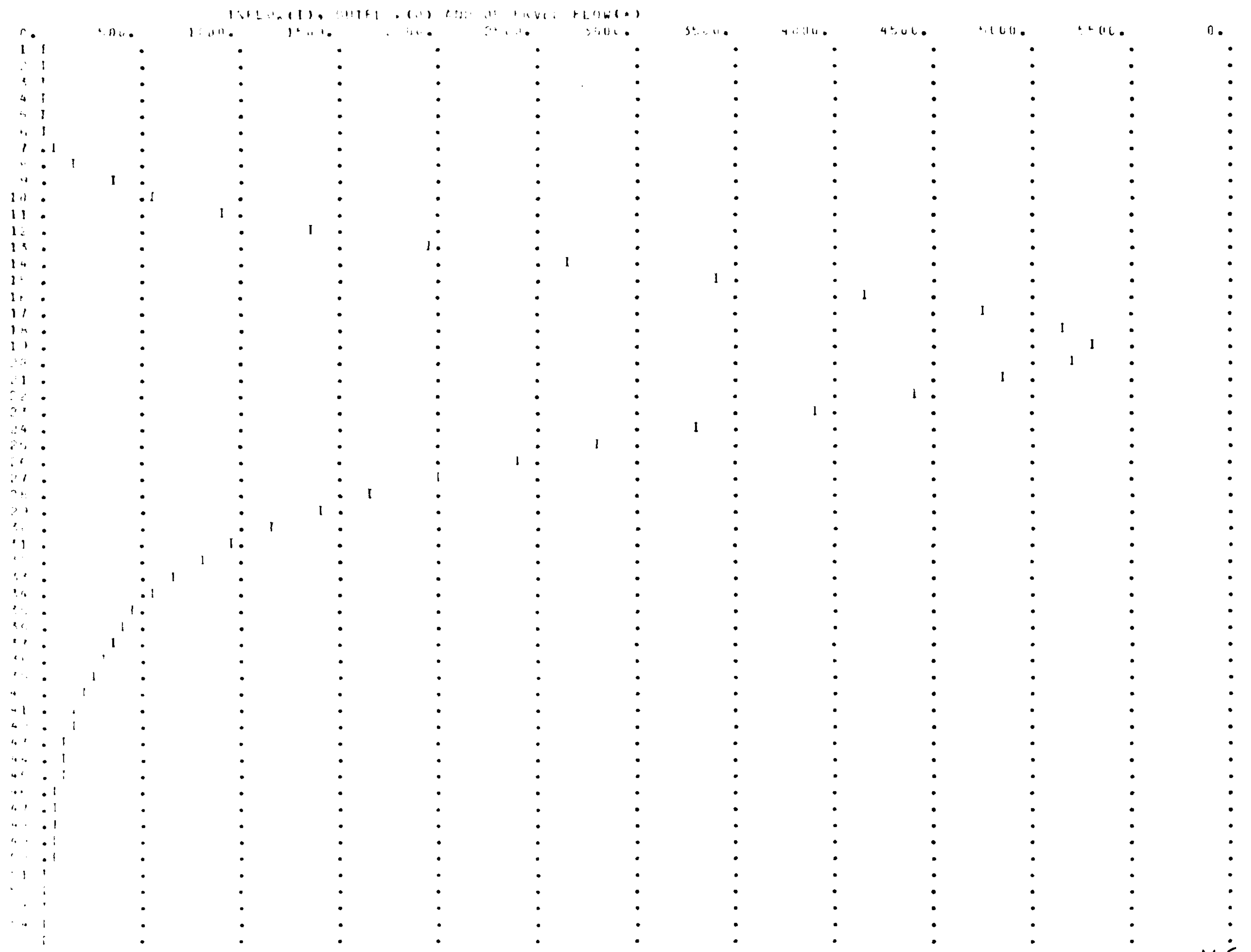
N.S-51

[illegible] FF [illegible] TIPLE[illegible] Y 0.

	0.	0.	[illegible]	[illegible]	24.	[illegible]	[illegible]	326.	569.
501.	[illegible]	1565.	[illegible]	5409.	4157.	4774.	5169.	5316.	5197.
4975.	4410.	3881.	[illegible]1.	[illegible]	[illegible]	1996.	1664.	1391.	1162.
467.	603.	672.	562.	478.	398.	336.	221.	232.	197.
16[illegible].	139.	11[illegible].	98.	[illegible]	68.	55.	45.	36.	27.
2[illegible].	13.	[illegible]	5.	1.	0.	0.	0.	0.	0.
[illegible]	0.	[illegible]	0.	1.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	[illegible]	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	[illegible]	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	[illegible]	[illegible]	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	[illegible]	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5318.	4166.	1455.	484.	69747.
INCHES		4.08	5.69	5.69	5.69
AC-FT		2067.	2884.	2884.	2884.

N.S-52



NS-53

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[illegible] HYDROGRAPH

[illegible] INFLOW INTO [illegible] RESERVOIR [illegible]

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
111111	2	0	0	2	0	1

SUM OF 2 HYDROGRAPHS AT111111

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	182.	200.	[illegible]	423.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4934.	[illegible]	5621.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3441.	[illegible]	3066.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1739.	1561.	1592.	1247.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	576.	504.	447.	396.	349.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	166.	152.	137.	123.	111.
[illegible]	91.	[illegible]	74.	67.	66.	54.	49.	44.	40.
[illegible]	37.	[illegible]	27.	[illegible]	22.	19.	17.	14.	12.
11.	9.	9.	7.	[illegible]	6.	5.	5.	5.	4.
[illegible]	[illegible]	4.	4.	3.	3.	3.	3.	2.	2.
[illegible]	[illegible]	2.	2.	[illegible]	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5621.	[illegible]	2162.	745.	107045.
INCHES		[illegible]	[illegible]	5.65	[illegible]
AC-FT		[illegible]	[illegible]	4426.	4426.

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N.S.-54

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....

[illegible] ROUTING

ROUTING THROUGH [illegible]

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
[illegible]	1	6	[illegible]	[illegible]	[illegible]	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
[illegible]	[illegible]	[illegible]	1	6

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	[illegible]	[illegible]	[illegible]	0.0	0.0	-1.

[illegible]	[illegible]	262.	524.	797.	1076.	1347.	1627.	1910.	0.	0.
[illegible]	0.	360.	1665.	[illegible]	[illegible]	4676.	114[illegible]	[illegible]614.	0.	0.

TIME	EOP STOR	AVG IN	COMP OUT
1	0.	0.	0.
[illegible]	[illegible]	220.	12.
[illegible]	24.	584.	53.
[illegible]	44.	[illegible]	47.
[illegible]	41.	225.	57.
[illegible]	47.	191.	64.
[illegible]	[illegible]	191.	71.
[illegible]	[illegible]	238.	80.
[illegible]	[illegible]	347.	95.
10	57.	357.	120.
11	115.	817.	158.
12	157.	1207.	216.
13	218.	1755.	300.
14	351.	[illegible]	464.
15	405.	[illegible]	742.
16	[illegible]	[illegible]	1071.
17	[illegible]	6627.	1571.
[illegible]	[illegible]	5160.	2081.
[illegible]	[illegible]	[illegible]04.	2554.
[illegible]	1[illegible]44.	6615.	3149.
[illegible]	[illegible]	5035.	[illegible]
[illegible]	[illegible]	[illegible]	3983.
[illegible]	1[illegible]30.	4676.	4031.
[illegible]	[illegible]	4465.	4167.
[illegible]	[illegible]	4109.	4151.
[illegible]	[illegible]	[illegible]00.	4067.
[illegible]	[illegible]	[illegible]	3984.
[illegible]	[illegible]	[illegible]	3860.
[illegible]	[illegible]	5157.	3724.
[illegible]	1231.	[illegible]	3586.
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	1171.	[illegible]	3268.
[illegible]	[illegible]	4607.	3124.
[illegible]	[illegible]	[illegible]	[illegible]

41	7[illegible].	[illegible]	[illegible]
42	7[illegible]	[illegible]	[illegible]
43	[illegible]	[illegible]	[illegible]13.
44	[illegible]	765.	[illegible]
45	[illegible]	[illegible]	[illegible]
46	[illegible]	[illegible]	[illegible]
47	[illegible]	547.	116[illegible].
48	[illegible]	475.	[illegible]
49	[illegible]	421.	1001.
[illegible]	476.	372.	[illegible]
51	454.	329.	872.
[illegible]	431.	293.	811.
[illegible]	409.	255.	753.
[illegible]	[illegible]	229.	698.
[illegible]	365.	200.	646.
[illegible]	351.	174.	597.
57	334.	16[illegible].	551.
[illegible]	31[illegible].	14[illegible].	509.
[illegible]	303.	130.	469.
[illegible]	[illegible]	117.	433.
61	276.	10[illegible].	398.
[illegible]	[illegible]	9[illegible].	367.
[illegible]	[illegible]	8[illegible].	348.
64	242.	73.	333.
[illegible]	2[illegible].	70.	319.
[illegible]	[illegible]	65.	305.
67	21[illegible].	57.	291.
[illegible]	202.	52.	278.
[illegible]	1[illegible]3.	47.	265.
70	184.	42.	253.
71	175.	38.	241.
72	167.	35.	229.
73	159.	31.	219.
74	151.	28.	208.
75	144.	25.	198.
76	137.	23.	188.
77	130.	20.	179.
78	124.	18.	170.
79	118.	15.	162.
[illegible]	112.	13.	153.
81	106.	11.	146.
[illegible]	100.	10.	138.
[illegible]	95.	[illegible].	131.
[illegible]	90.	8.	124.
[illegible]	85.	7.	118.
[illegible]	81.	[illegible].	111.
[illegible]	77.	[illegible].	106.
[illegible]	73.	5.	100.
[illegible]	69.	5.	95.
[illegible]	65.	5.	90.
91	62.	4.	85.
[illegible]	59.	4.	81.
[illegible]	56.	4.	76.
[illegible]	53.	3.	72.
[illegible]	50.	3.	69.
[illegible]	47.	3.	65.
[illegible]	45.	3.	62.
[illegible]	42.	3.	58.
[illegible]	41.	3.	55.
100	38.	2.	52.

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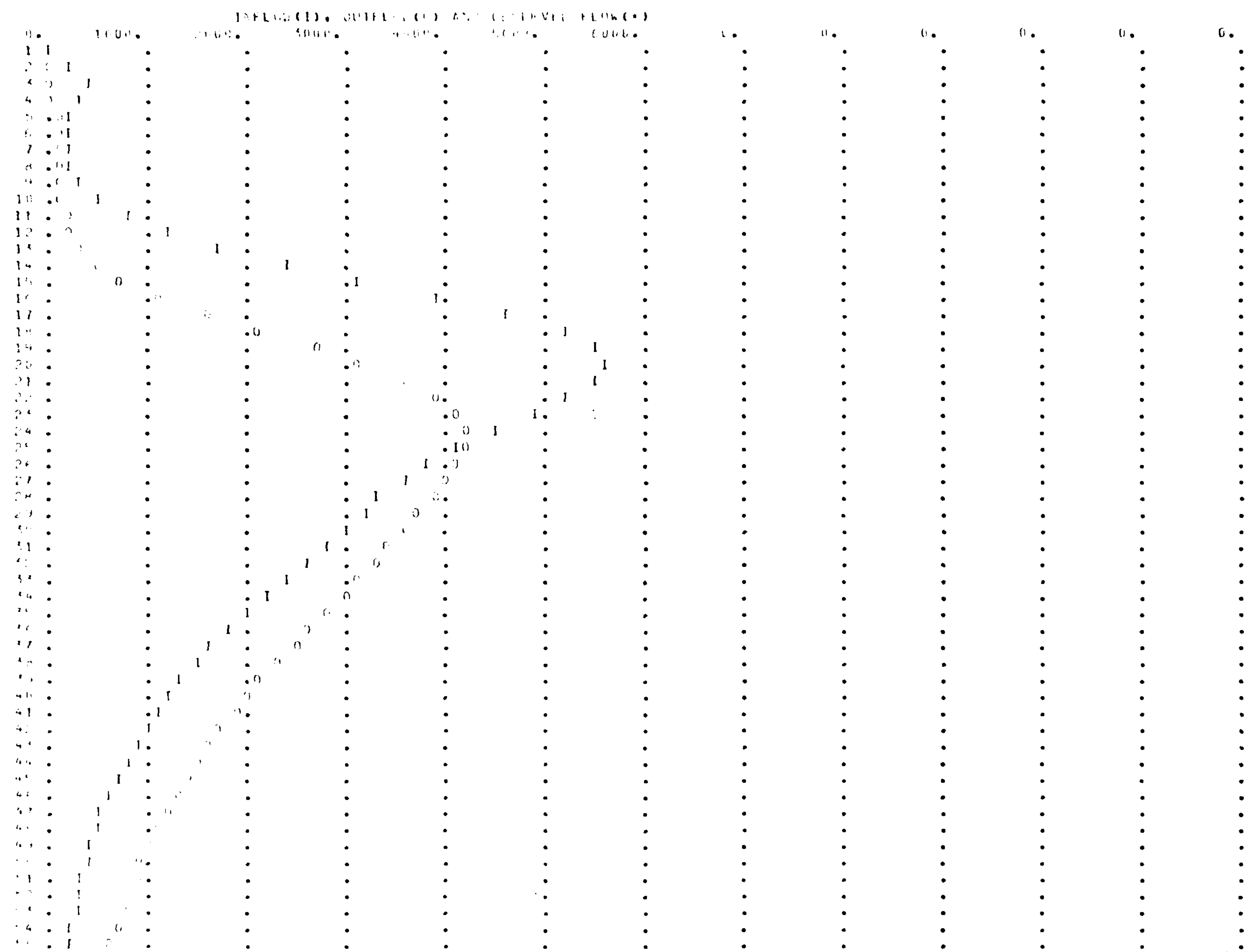
102	[illegible]	2.	47.
103	[illegible]	[illegible]	44.
104	[illegible]	[illegible]	42.
105	[illegible]	[illegible]	40.
106	27.	2.	38.
107	[illegible]	[illegible]	36.
108	[illegible]	1.	34.
109	[illegible]	1.	32.
110	[illegible]	1.	30.
111	21.	1.	29.
112	20.	1.	27.
113	19.	1.	26.
114	18.	1.	24.
115	17.	1.	23.
116	16.	1.	22.
117	15.	1.	21.
118	14.	1.	20.
119	14.	1.	19.
120	13.	1.	18.
121	12.	1.	17.
122	11.	1.	16.
123	11.	1.	15.
124	10.	1.	14.
125	10.	1.	13.
126	9.	0.	13.
127	9.	0.	12.
128	8.	0.	11.
129	8.	0.	11.
130	7.	0.	10.
131	7.	0.	10.
132	7.	0.	9.
133	6.	0.	9.
134	6.	0.	8.
135	6.	0.	8.
136	5.	0.	7.
137	5.	0.	7.
138	5.	0.	7.
139	5.	0.	6.
140	4.	0.	6.
141	4.	0.	6.
142	4.	0.	5.
143	4.	0.	5.
144	[illegible]	0.	5.
145	3.	0.	4.
146	3.	0.	4.
147	3.	0.	4.
148	3.	0.	4.
149	3.	0.	4.
150	2.	0.	3.

[illegible] 106986.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	41[illegible]7.	[illegible]	[illegible]	743.	106986.
INCHES		[illegible]	[illegible].37	[illegible]	[illegible].84
AC-FT		[illegible]	[illegible]	442[illegible].	44[illegible]5.

N.S-58

STATION ....



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SUB-AREA RUNOFF COMPUTATION

INFLOW TO NORTH STAMFORD

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
4	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
[illegible]	-1	[illegible]	0.0	[illegible]	0.0	0.350	0	0	0

PRECIP DATA

NP	STORM	DAJ	DAK
12	0.0	0.0	0.0

PRECIP PATTERN

0.40	0.40	0.89	1.07	1.16	1.34	1.70	4.94	1.16	1.16
[illegible]	0.40								

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.0	0.0	1.00	0.0	0.0	1.00	0.0	0.0	0.0	0.0

GIVEN UNIT GRAPH, NUHGQ= 64

[illegible]	16.	35.	64.	[illegible]	141.	179.	234.	292.	350.
405.	452.	490.	515.	535.	545.	537.	526.	505.	479.
451.	415.	359.	355.	[illegible]	296.	272.	248.	223.	209.
191.	174.	161.	148.	133.	123.	112.	100.	93.	84.
7[illegible]	69.	63.	58.	53.	49.	45.	41.	38.	36.
33.	30.	27.	24.	22.	20.	18.	17.	16.	15.
13.	12.	11.	10.						

UNIT GRAPH TOTALS 11695. CFS OR 1.01 INCHES OVER THE AREA

RECESSION DATA

STRTQ= 0.0 QRCSN= 0.0 RTIOR= 1.00

END-OF-PERIOD FLOW

TIME	RAIN	EXCS	COMP Q
1	0.40	0.40	2.
2	0.40	0.40	8.
3	0.89	0.89	25.
4	1.07	1.07	59.
5	1.16	1.16	118.
6	1.34	1.34	214.
7	1.70	1.70	352.
8	4.94	4.94	565.
9	1.16	1.16	861.
10	1.16	1.16	1254.
11	[illegible]	[illegible]	1750.
12	[illegible]	[illegible]	2321.
13	[illegible]	[illegible]	2995.
14	[illegible]	[illegible]	3677.
15	[illegible]	[illegible]	4445.
16	[illegible]	[illegible]	5208.
17	[illegible]	[illegible]	5944.
18	[illegible]	[illegible]	6611.
19	[illegible]	[illegible]	7194.

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[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	7777.
[illegible]	[illegible]	[illegible]	[illegible]
27	[illegible]	[illegible]	7201.
[illegible]	[illegible]	[illegible]	6777.
[illegible]	0.0	[illegible]	6514.
[illegible]	[illegible]	[illegible]	[illegible]
31	0.0	0.0	5423.
32	0.0	0.0	4975.
33	0.0	0.0	4552.
34	0.0	0.0	4175.
35	0.0	0.0	3813.
36	0.0	0.0	3475.
37	0.0	0.0	3198.
38	0.0	0.0	2925.
39	0.0	0.0	2675.
40	0.0	0.0	2454.
41	0.0	0.0	2249.
42	0.0	0.0	2046.
43	0.0	0.0	1872.
44	0.0	0.0	1706.
45	0.0	0.0	1547.
46	0.0	0.0	1415.
47	0.0	0.0	1287.
48	0.0	0.0	1167.
49	0.0	0.0	1067.
50	0.0	0.0	976.
51	0.0	0.0	894.
52	0.0	0.0	819.
53	0.0	0.0	754.
54	0.0	0.0	693.
55	0.0	0.0	636.
56	0.0	0.0	585.
57	0.0	0.0	541.
58	0.0	0.0	495.
59	0.0	0.0	452.
60	0.0	0.0	412.
61	0.0	0.0	375.
62	0.0	0.0	342.
63	0.0	0.0	311.
64	0.0	0.0	283.
65	0.0	0.0	258.
66	0.0	0.0	234.
67	0.0	0.0	208.
68	0.0	0.0	178.
69	0.0	0.0	153.
70	0.0	0.0	128.
71	0.0	0.0	101.
72	0.0	0.0	47.
73	0.0	0.0	32.
74	0.0	0.0	19.
75	0.0	0.0	8.
76	0.0	0.0	0.
77	0.0	0.0	0.
78	0.0	0.0	0.
79	0.0	0.0	0.
80	0.0	0.0	0.

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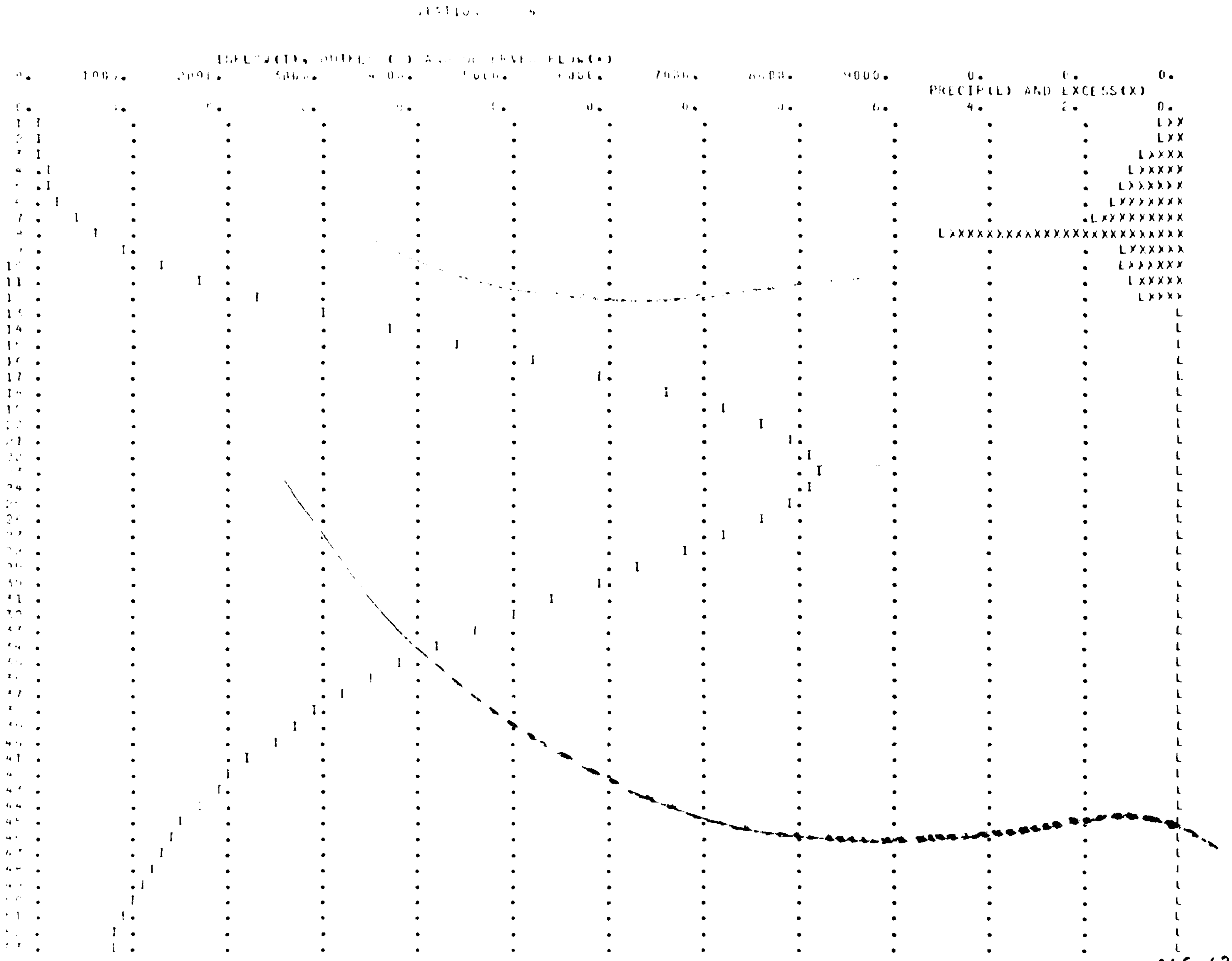

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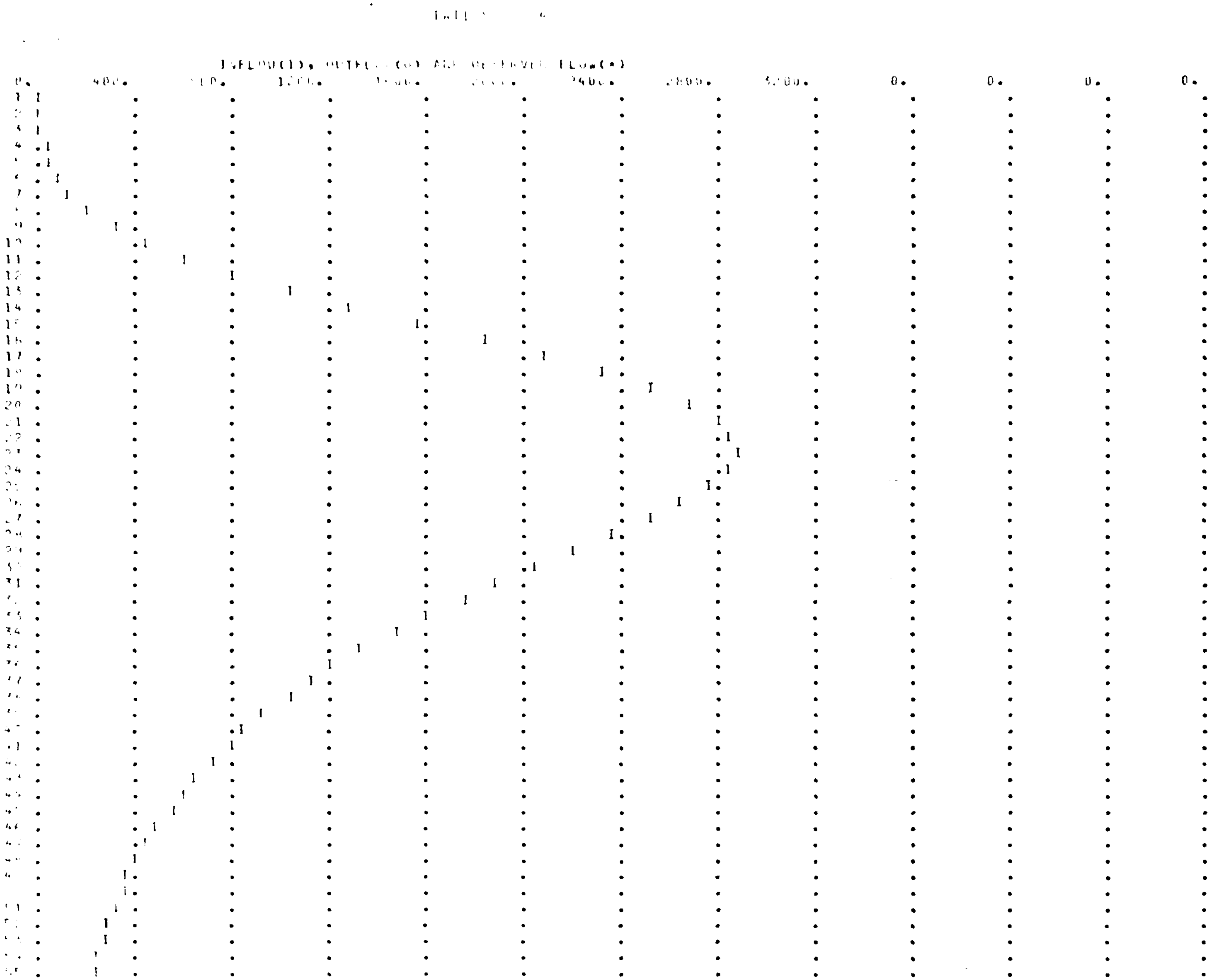
[illegible]

[illegible]	5.	[illegible]	[illegible]	1.	75.	[illegible]	[illegible]	301.	439.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1823.	2081.	[illegible]	2518.	[illegible]
[illegible]	2849.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2210.	2658.
[illegible]	[illegible]	[illegible]	1461.	[illegible]	1216.	1119.	1024.	936.	[illegible]
787.	[illegible]	[illegible]	[illegible]	[illegible]	495.	450.	408.	373.	341.
[illegible]	247.	[illegible]	[illegible]	[illegible]	205.	189.	173.	158.	144.
131.	[illegible]	[illegible]	99.	[illegible]	82.	[illegible]	62.	54.	45.
[illegible]	16.	11.	7.	[illegible]	6.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	[illegible]	[illegible]	[illegible]	455.	65514.
INCHES		2.70	[illegible]	5.64	5.64
AC-FT		[illegible]	[illegible]	[illegible]	2709.

N.S.-63



N.5-64

COMBINE HYDROGRAPHS

TOTAL INFLOW TO NORTH TANFORD INCLUDING OUTFLOW FROM L

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
10	2	0	0	2	0	1

SUM OF 2 HYDROGRAPHS AT 10

1.	1[illegible].	41.	6[illegible].	[illegible]	139.	194.	278.	396.	558.
771.	1128.	134[illegible].	175[illegible].	22[illegible]7.	2834.	3651.	4395.	5172.	5625.
[illegible]367.	6753.	6957.	6994.	6512.	6738.	6504.	6235.	5934.	5638.
[illegible]	5009.	4717.	4453.	4147.	3965.	3600.	3337.	3083.	2856.
[illegible]	2454.	226[illegible].	2090.	1920.	1765.	1616.	1477.	1374.	1277.
118[illegible].	1098.	1017.	940.	878.	802.	741.	682.	628.	577.
[illegible]	465.	4[illegible]7.	432.	409.	387.	364.	340.	319.	297.
[illegible]	246.	230.	215.	201.	188.	179.	170.	162.	153.
14[illegible].	138.	131.	124.	118.	111.	106.	100.	95.	90.
[illegible]	81.	76.	72.	[illegible]	65.	62.	58.	55.	52.
5[illegible].	47.	44.	42.	40.	38.	36.	34.	32.	30.
2[illegible].	27.	26.	24.	23.	22.	21.	20.	19.	18.
17.	16.	15.	14.	13.	13.	12.	11.	11.	10.
1[illegible].	9.	9.	8.	8.	7.	7.	7.	6.	6.
[illegible]	5.	5.	5.	4.	4.	4.	4.	4.	3.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6994.	6349.	3345.	1198.	172500.
INCHES		2.59	5.37	5.77	5.77
AC-FT		3150.	6647.	7131.	7132.

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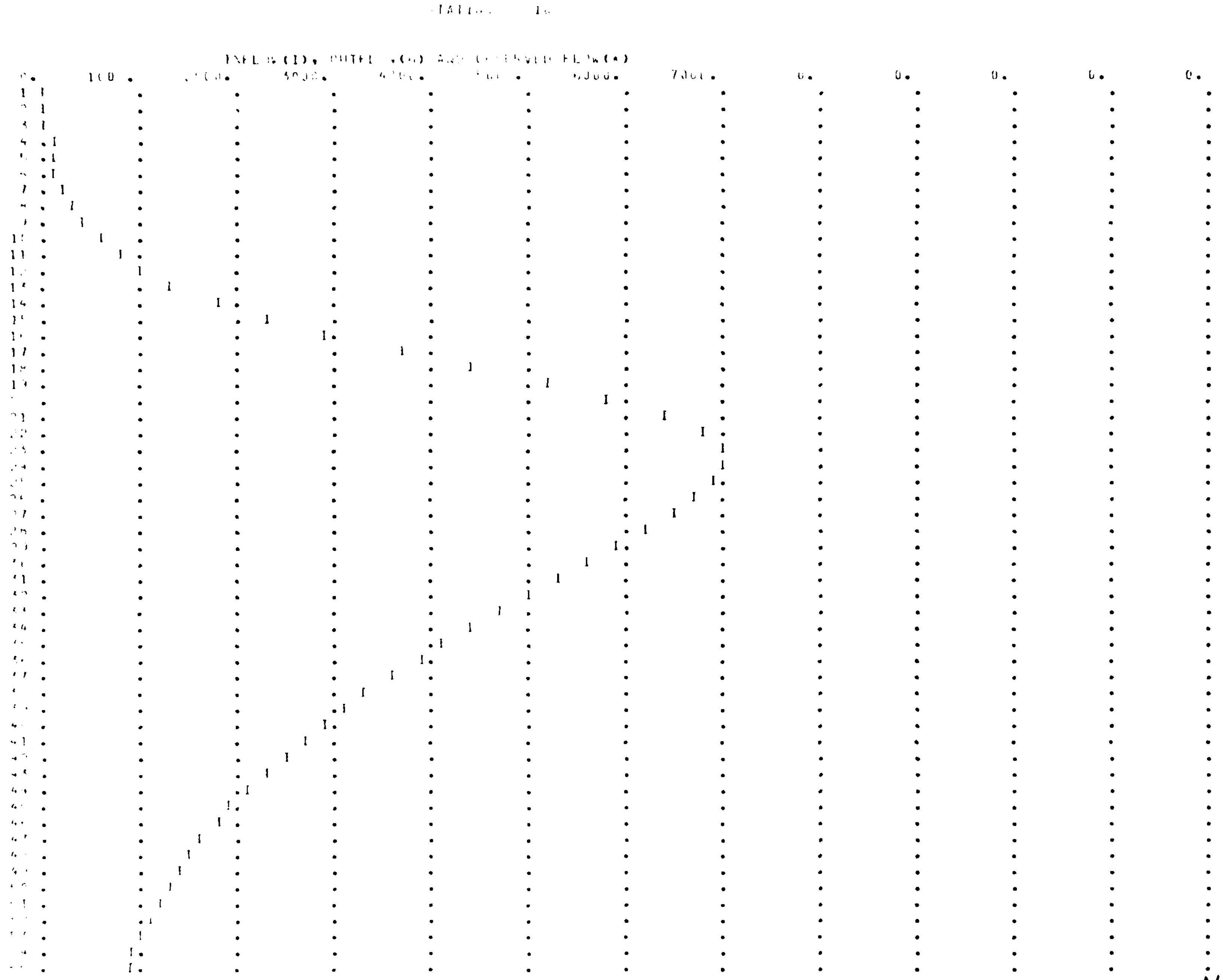
N.S.-65



N.S.-66

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HYDROGRAPH ROUTING

ROUTING THROUGH [illegible]

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
100	1	0	0	2	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA
1	0	0	0.0	0.0	0.0	-1.

STORAGE	11[illegible].	231.	354.	4[illegible].	[illegible].	617.	687.	757.	830.	903.
OUTFLOW	[illegible]7.	2493.	4746.	7[illegible].	[illegible].	11997.	14960.	17980.	21860.	26251.

TIME	EOP STOR	AVG IN	EOP OUT
1	151.	1.	1.
[illegible]	113.	8.	660.
[illegible]	86.	2[illegible].	490.
4	72.	59.	296.
[illegible]	66.	85.	201.
[illegible]	63.	118.	164.
7	63.	167.	165.
[illegible]	65.	236.	197.
[illegible]	70.	337.	259.
1[illegible]	77.	477.	336.
11	87.	664.	493.
12	100.	899.	674.
13	116.	1189.	905.
14	137.	1550.	1190.
15	164.	[illegible].	1561.
16	197.	2596.	2021.
17	237.	3275.	2598.
18	280.	4023.	3361.
19	[illegible].	4783.	4152.
20	3[illegible]2.	5494.	4911.
21	[illegible].	6097.	5640.
[illegible]	4[illegible]1.	[illegible].	6213.
[illegible]	[illegible].	[illegible].	6611.
[illegible]	[illegible].	[illegible].	6857.
[illegible]	[illegible].	[illegible].	[illegible].
[illegible]	[illegible]1.	[illegible].	[illegible].
[illegible]	444.	[illegible]21.	6711.
[illegible]	[illegible].	[illegible].	[illegible].
[illegible]	[illegible].	[illegible].	[illegible]41.
[illegible]	[illegible].	[illegible].	[illegible].
[illegible]	[illegible].	[illegible].	[illegible].
[illegible]	[illegible].	[illegible]167.	[illegible].
[illegible]	[illegible].	[illegible].	[illegible].
[illegible]	[illegible].	[illegible].	[illegible].
[illegible]	[illegible]1.	[illegible].	[illegible].
[illegible]	[illegible].	[illegible].	[illegible].
[illegible]	[illegible]11.	[illegible].	[illegible].
[illegible]	[illegible].	[illegible].	[illegible].
[illegible]	[illegible].	[illegible]1[illegible].	[illegible].

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NS-68

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	45.
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	37.
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	51.	[illegible]
[illegible]	[illegible]	50.	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	28.
[illegible]	[illegible]	[illegible]	27.
[illegible]	[illegible]	26.	26.
[illegible]	[illegible]	25.	24.
[illegible]	[illegible]	21.	23.
[illegible]	[illegible]	20.	22.
[illegible]	[illegible]	[illegible]	21.
[illegible]	[illegible]	18.	19.
[illegible]	[illegible]	17.	18.
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[illegible]	[illegible]	[illegible]	17.
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[illegible]	[illegible]	[illegible]	13.
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[illegible]	[illegible]	10.	11.
[illegible]	[illegible]	[illegible]	11.
[illegible]	[illegible]	[illegible]	10.
[illegible]	[illegible]	[illegible]	10.
[illegible]	[illegible]	[illegible]	9.
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[illegible]	[illegible]	[illegible]	8.
[illegible]	[illegible]	7.	8.
[illegible]	[illegible]	7.	7.
[illegible]	[illegible]	6.	7.
[illegible]	[illegible]	6.	7.
[illegible]	[illegible]	[illegible]	6.
[illegible]	[illegible]	[illegible]	6.
[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	4.
[illegible]	[illegible]	[illegible]	4.
[illegible]	[illegible]	[illegible]	4.
1	1.	[illegible]	4.

1744?0.

	[illegible]	[illegible]	[illegible]	[illegible]	TOTAL VOLUME
[illegible]	[illegible]	[illegible]	[illegible]	1211.	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]

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AD-A142 763 NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS NORTH STAMFORD RESERV..(U) CORPS OF ENGINEERS WALTHAM MA NEW ENGLAND DIV FEB 79 3/3

UNCLASSIFIED F/G 13/13 NL

END
DATE
FILMED
8 84
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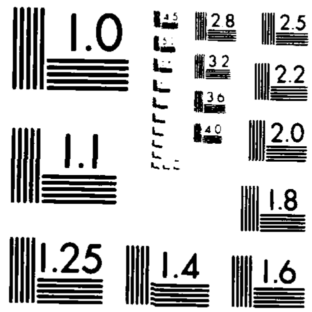
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2.8
3.2
3.6
4.0
4.5

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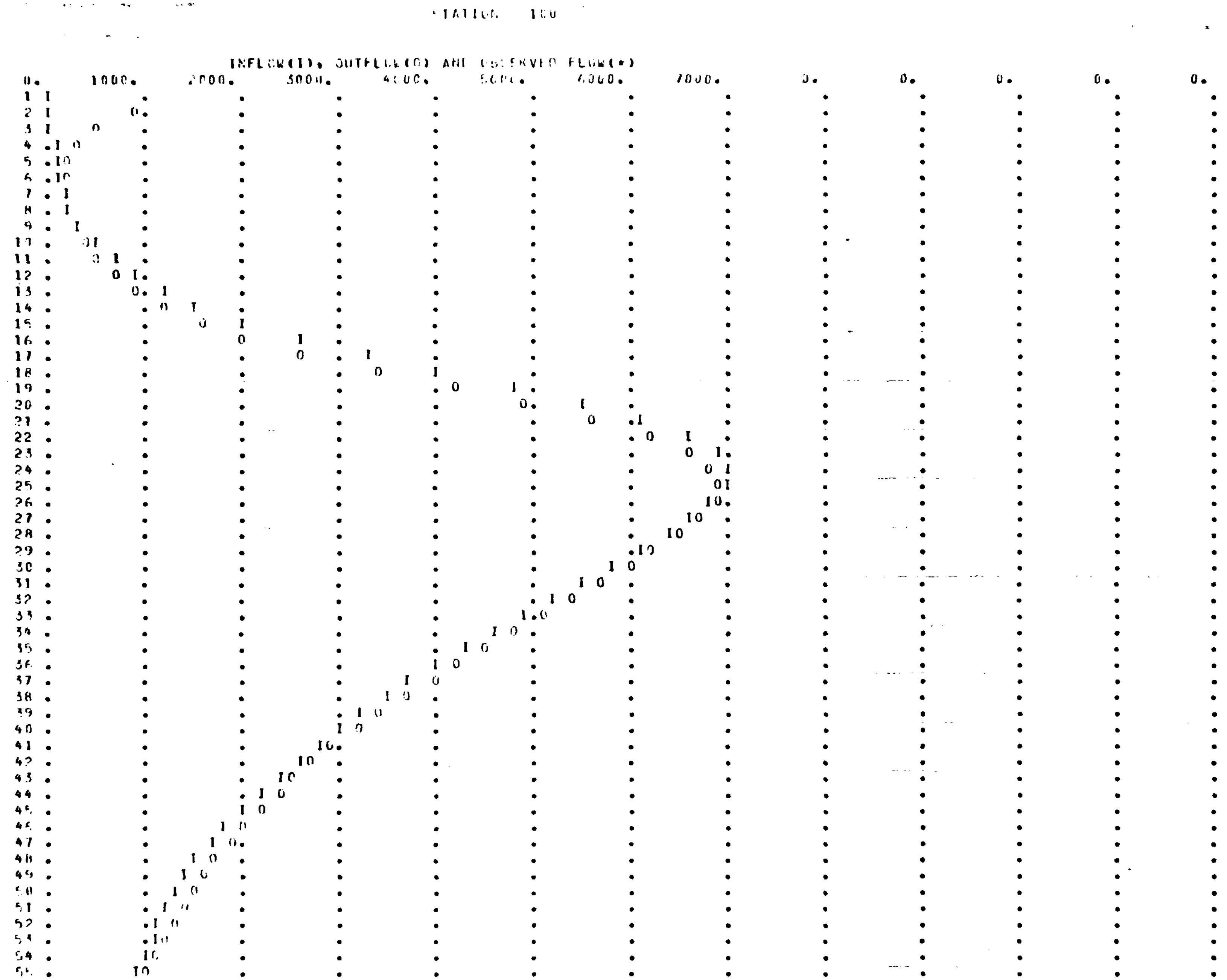
STATION 100
INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)
0. 1000. 2000. 3000. 4000. 5000. 6000. 7000. 0. 0. 0. 0. 0.

RUNOFF SUMMARY, AVERAGE FLOW

		PEAK	6-HOUR	24-HOUR	72-HOUR	AREA
HYDROGRAPH AT	1	1658.	1436.	613.	207.	4.07
ROUTED TO	1111	1576.	1376.	612.	214.	4.07
HYDROGRAPH AT	2	766.	262.	95.	32.	0.62
ROUTED TO	11	227.	199.	119.	45.	0.62
2 COMBINED	0	1731.	1530.	716.	259.	4.69
HYDROGRAPH AT	3	5518.	4166.	1455.	484.	9.50
2 COMBINED	111111	5621.	4057.	2162.	743.	14.19
ROUTED TO	1111111	4167.	3019.	2048.	743.	14.19
HYDROGRAPH AT	4	2666.	2612.	1322.	455.	9.00
2 COMBINED	10	6994.	6349.	3349.	1198.	23.19
ROUTED TO	100	6909.	6232.	3342.	1211.	23.19

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APPENDIX E

INFORMATION AS CONTAINED IN
THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

STATE	IDENTITY NUMBER	DIVISION	STATE	COUNTY	CONGR DIST	STATE	COUNTY	CONGR DIST	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE DAY MO YR
CT	4H	NED	CT	001	04				NORTH STAMFORD RESERVOIR DAM	4107.5	7235.5	05MAR79

POPULAR NAME	NAME OF IMPOUNDMENT
	NORTH STAMFORD RESERVOIR

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DIST FROM DAM (MI)	POPULATION
01	07	RIPPOWAM RIVER	RIDGEWAY	3	11000

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT)	HYDRAULIC HEIGHT (FT)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT)	IMPOUNDING CAPACITIES NORMAL (ACRE-FT)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
RECTEG	1904	S	24	24	2060	1571	NED	N	N	N	N	5MAR79

REMARKS

D/S HAS	SPILLWAY CREST LENGTH	SPILLWAY TYPE	SPILLWAY WIDTH (FT)	MAXIMUM DISCHARGE (FT)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (MW)	POWER CAPACITY PROPOSED (MW)	NO	NAVIGATION LOCKS LENGTH (FT)	WIDTH (FT)	LENGTH (FT)	WIDTH (FT)	LENGTH (FT)	WIDTH (FT)	LENGTH (FT)	WIDTH (FT)
1	1067		280	7350	26180											

OWNER	ENGINEERING BY	CONSTRUCTION BY
STAMFORD WATER COMPANY	ALBERT E HILL	

DESIGN	REGULATORY AGENCY CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

INSPECTION BY	INSPECTION DATE DAY MO YR	AUTHORITY FOR INSPECTION
LOUIS BERGER + ASSOCIATES	25OCT78	PL92-367

REMARKS

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